UNITED ARAB EMIRATES

a new perspective

Edited by
IBRAHIM AL ABED
PETER HELLYER

AN INVALUABLE RESOURCE ON THE GEOLOGICAL, HISTORICAL, SOCIAL, POLITICAL, ECONOMIC AND CULTURAL DEVELOPMENT OF THE UAE

Thirty years ago the United Arab Emirates (UAE), a federation of seven emirates occupying a strategic position on the southern Arabian Gulf, came into being. Since then the seven, Abu Dhabi, Dubai, Sharjah, Ra's al-Khaimah, Ajman, Umm al-Qaiwain, and Fujairah, have confounded pessimistic predictions and forged a thriving state united in its diversity. However, the federation has not just made its mark as the longest surviving successful experiment in federation anywhere in the Arab world, it has experienced in the intervening years one of the speediest and most remarkable rates of economic and social development in the history of the region.

Parallel with the development that has taken place since 1971, there has been an explosion in academic research on the country, as scholars both from within the UAE and abroad have studied a wide range of aspects of the state.

This unique volume, a collection of papers by some of those leading scholars, places the country's meteoric progress in context, providing in one book an invaluable introduction both to the UAE and the region as a whole. Contributors provide up-to-date information on geology, history and traditional structures in the UAE, examine the political background to the foundation of the state, analyse the economic conditions which have provided such a high standard of living for its citizens, and at the same time highlight the UAE's significant role in the global community.

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Introduction

At the end of 2001, the United Arab Emirates celebrates the completion of its first 30 years as an independent federal state. Over the period since its formal creation on 2 December 1971, the country has witnessed dramatic changes as the revenues from its oil and gas production have been put to good use in the building of a modern infrastructure, while its population has grown by over ten fold.

That process of change has taken place against a backdrop of social stability and political continuity that is all the more remarkable because of the upheavals and conflicts that have affected other parts of the Arabian Gulf region.

Prior to the establishment of the UAE, few outside the region knew much of the seven emirates of which it is comprised, and fewer still had visited the area. Although oil production and export had commenced a few years earlier, the process of modern development had still to get properly under way. Many observers felt, indeed, that the new state had little chance of surviving as a viable entity.

Yet, 30 years later, the United Arab Emirates is the longest surviving successful experiment in federation anywhere in the Arab world, and has matured to become a country which not only offers its population a modern lifestyle but also is widely recognized as having a significant role to play within the global community of nations.

Parallel with the development that has taken place since 1971, there has been an explosion in academic research on the country, as scholars both from within the UAE and abroad have studied a wide range of aspects of the state, including not only its recent history and development, but also its past and the nature of country itself.

This book brings together a collection of papers by leading scholars and is designed to provide a broad introduction to the UAE, its origins, environment, people and development. It seeks, thereby, to provide an outline of the country and, for those eager to learn more, to offer a starting point for further reading and research.

An earlier collection of papers, entitled *Perspectives on the United Arab Emirates*, was published in early 1997, to coincide with the twenty-fifth anniversary of the state. Since then, much has happened, not only in terms of the development of the country, but also in terms of research. While some chapters from that book are included in the present volume, several new chapters have been written, on foreign policy, industrialization, oil and gas, the environment and poetry, and other chapters have been extensively rewritten and updated to incorporate the results of new research as well as recent developments. This second collection of papers, with a new title, seeks to present, therefore, an overview of the country at the beginning of the twenty-first century.

The emergence of the landscape of the country is well described by Kenneth Glennie, who has undertaken extensive research into the geology of the Emirates, including the formation of the oil and gas bearing rock strata which today provide the major source of national revenues. He also examines the impact of global changes in climate and in the moving of the world's continental plates to explain how the country was formed.

The origins of the people of the Emirates are discussed in two chapters by Daniel Potts and Geoffrey King, who trace the prehistory and history of the UAE from the dawn of human settlement in the country around 7500 years ago. Through their own research, as well as that by other archaeologists and historians, it is now plain that, although the UAE may be a small country with an unfavourable climate, it has played a significant role in the evolution of civilization in the region for many thousands of years.

Frauke Heard Bey provides two chapters on the traditional lifestyle of the Emirati people, including the important tribal structure, and on the history of the twentieth century evolution from a collection of disparate sheikhdoms on the periphery of the British Empire into the federation of today.

The nature of the federation itself, and the way in which a successful sharing of authority between the federal government and those of the individual emirates has emerged, is examined by Ibrahim Al Abed, who provides an authoritative background to the discussions that led up to the formation of the federation and to the adoption of the national constitution.

The circumstances under which the federation was formed and the institutions of the federation are also discussed by Malcolm Peck, who studies the operation of those institutions, and also reviews the way in which modern governmental structures have been able to co-exist with the traditional, and still relevant, forms of local and tribal authority.

The way in which the country has earned itself respect in the global arena is analysed in a chapter on foreign policy by Peter Hellyer, who reviews the basic elements of the country's foreign policy and the way in which it has evolved over the three decades since the formation of the federation, moving from a focus on purely regional issues to a more global approach.

A second chapter on foreign policy issues, by Mohammed Al Roken, examines the dispute with Iran over the three UAE islands of Abu Musa and Greater and Lesser Tunb, occupied by Iran since just before the federation was established. This chapter reviews the historical status of the islands and legal issues arising out of the Iranian occupation, going on to record the attempts made by the United Arab Emirates to achieve a peaceful resolution to the dispute.

Turning back to internal affairs, and, in particular, the modern development of the country, Ali Al Sadik investigates the process of economic development in the oil era, providing a useful array of statistics that show the contrasting growth of the oil and non oil sectors in the UAE Gross Domestic Product. He also deals with the economic aspects of the dependence upon a largely expatriate labour force and with the widely recognized need for a further diversification of the national economy.

The oil and gas industry itself is examined by Gerald Butt, who traces its evolution from the early days of exploration in the 1950s to the major role it plays today as a source of revenues and of employment for the people of the Emirates. Without these revenues, the development of the UAE could not have taken place in the same way, and this chapter shows clearly how the country's hydrocarbon reserves have provided the fuel for growth.

Mohammed Shihab enumerates and analyses the factors that have led to the socio-economic transformation of the country since 1971. He notes, *inter alia*, that the accessibility to revenues from the oil and gas industry has permitted the UAE to compress decades of economic growth into a relatively short period.

That has been made possible in part by the way in which the UAE has developed its industrial sector, first as a downstream sector of the oil and gas industry, and then, increasingly, in the non-oil sector. The achievements and problems of this process are scrutinized by Shihab M. Ghanem.

Simon Aspinall looks at the wildlife and environment of the Emirates, providing data to challenge the common misconception that deserts have little to offer in the way of Nature, and examining the way in which conservation of wildlife and the environment has become a key priority of Government policy over the course of the last three decades.

Finally, taking a look at an aspect of the cultural development of the country, Shihab M. Ghanem, himself a prominent local poet, traces the evolution of the country's poets and poetry.

In the nature of books such as this, it is impossible to provide an exhaustive review of the culture, history, heritage, development and landscape of the United Arab Emirates. Moreover, the process of scholarly study into a wide range of topics is continuing to produce valuable new data. It is our hope, however, that this new collection of papers will not only provide a useful introduction to the United Arab Emirates, but will also prompt further study. Through such a process, not only can researchers, and others, learn more about the country, but also citizens and residents of the UAE can come to know the country better. That, in turn, will be of benefit for the process of further development.

The Editors

Evolution of The Emirates' Land Surface: an Introduction

K.W. Glennie

Introduction

With the exception of the Omani territory in the north-eastern Ru'us al-Jibal (Musandam peninsula) and north-central Oman Mountains, the United Arab Emirates (UAE) occupies a broad strip of land flanking the southern shores of the Arabian Gulf between the Qatar peninsula and the Gulf of Oman. Much of that land consists of relatively low-lying rolling dunes and interdune areas forming the north-eastern limit of the Rub al-Khali (Empty Quarter of Saudi Arabia), which reach 150 m above sea level in the region to the north of Al Liwa. In the northern emirates, the dunes extend up to the Oman Mountains. To the south-east, however, the eastern limit of the dunes coincides approximately with the Oman border, where they overlie the *deflated* (wind eroded) surface of sub-horizontal fluvial sediments that had earlier been transported westward from the mountains (Fig. 1).

A general lack of rainfall ensures that most of Arabia is a desert. Summer temperatures can approach 50°C on the Gulf coast of the Emirates, where relative humidity averages between 50 and 60 per cent. Inland, however, temperatures can exceed 50°C and relative humidity be less than 20 per cent (United Arab Emirates University). Over the western lowlands of the Emirates, annual rainfall is mostly less than 40 mm. In Al Ain the mean annual rainfall is 96 mm and yet the potential yearly evaporation is over 3000 mm (*op.cit.* Plate 44). With a high rate of evaporation and an annual rainfall over the Oman Mountains that rarely reaches 200 mm, this highland area, which has elevations within the Emirates of over 1500 m, must also be classified as desert; its desert status is emphasized by its surface of almost continuous barren rock and a sparse vegetation confined mostly to the floors of wadis.

With the exception of the south-western Ru'us al-Jibal, the rocks exposed within the mountains of the Emirates differ markedly from those that contain deeply buried oil and gas fields in the west and beneath the southern Gulf. Also, the extensive plains of fluvial sediments that flank the mountains are evidence of a former, much wetter, climate than is indicated by the younger dune sands and salt-covered *sabkha*s that overlie their extremities. The history of deposition and deformation of these rock units, the much more recent evidence of rapid changes in climate from very humid to hyper-arid, together with the geological processes that culminated in today's desert surface, form the topic of the following pages.

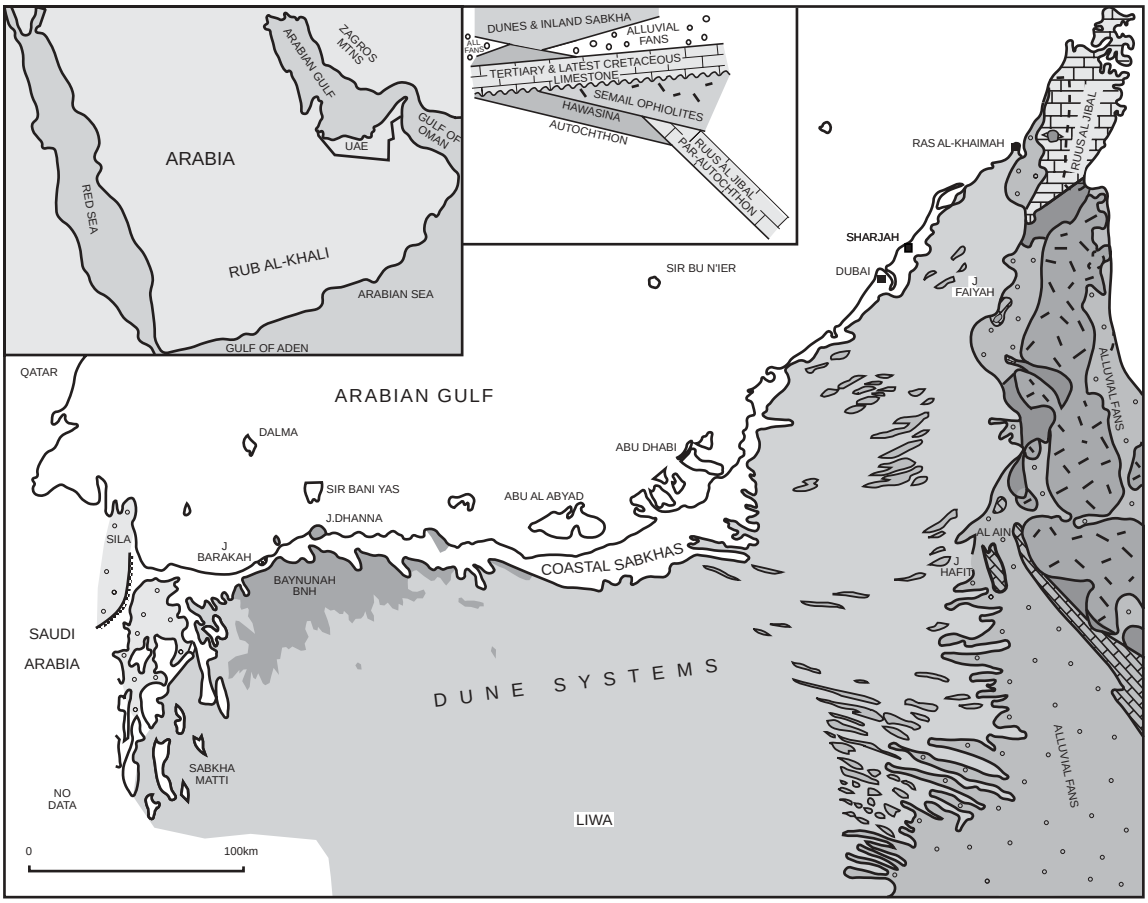

Fig. 1. Simplified geological map of the United Arab Emirates. Inset diagram indicates some of the complex geometrical relationships between rock units of the mountains and flanking areas. See also Table 1.

Mountain and Subsurface Geological Framework

The subsurface

The oldest exposed rocks underlie the whole of the Emirates except the Oman Mountains and immediate flank areas; they are seen at only two localities on the mainland, Jebel Ali south-west of Dubai and Jebel Dhanna in the western part of Abu Dhabi, but also occur on several offshore islands (e.g. Sir Bani Yas, Sir Abu Nu'air: Fig. 1). These jebels and islands are dome-shaped at the surface and are cored by Hormuz Salt (named after similar salt on Hormuz Island in the Straits of Hormuz). The salt was deposited almost 600 million years ago on the floor of an almost enclosed sea when evaporation resulted in its water becoming super-saturated with respect to *halite* (common salt) (see also Glennie 1987: Fig. 12a). About 20 million years before the present (20 Ma BP), the Red Sea was also floored by salt in a similar way. Salt can flow and, unlike the sedimentary rocks that overlie it, cannot be compacted with increased depth of burial. For this reason, the salt is now less dense than most of its overburden and, using any vertical weakness, penetrates upward *(diapirism)* through the overlying rock sequence to form *salt domes* at the surface. In the south-eastern Gulf, the source of the diapiric Hormuz salt now lies at a depth of some 10 km (Beydoun 1991). *Hydrocarbon source rocks* of similar age occur in Oman, and may be present in the Gulf area, but because of deep burial

must long since have generated their oil and gas. Several of the offshore salt domes are associated with the occurrence of oil and gas where *reservoir rocks* have been deformed by the rising salt to create a *trap* (e.g. Umm Shaif, Zakum).

Arabia, as part of the megacontinent *Gondwana*, was located south of the Equator throughout the Palaeozoic era (Table 1). Initially it was geometrically 'up-side-down' (Fig. 2) relative to the poles as Gondwana moved south across the south pole (and came up the other side the 'right-way up') under the influence of *plate-tectonic* processes (see below). Because Arabia's southern traverse was undertaken largely in temperate latitudes, most of the Palaeozoic rocks comprise sandstones and shales, a small exposure of which occurs in Jebel Rann, south-west of Dibba. Hydrocarbon source rocks of Silurian age are known in both Oman and Saudi Arabia, and might be viable for the generation of oil also in western Abu Dhabi.

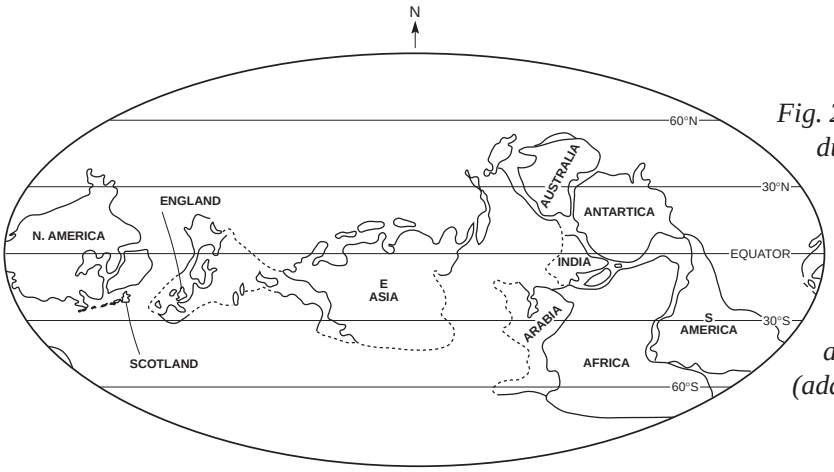

Fig. 2. Distribution of continental plates during the early Palaeozoic. Arabia then formed part of a megacontinent called Gondwana, which included Australia, Antarctica, India, Africa and South America. Gondwana was separated from eastern Asia by an ancient ocean called Tethys (adapted from Smith et al., 1981).

In complete contrast, between the Late Permian (about 260 Ma BP) and Late Miocene (part of Neogene on Table 1; about 5–10 Ma BP), Arabia slowly drifted northwards across the Tropics, where warm, shallow, tropical seas were ideal for the growth of corals and other shallow-marine creatures with calcareous shells; their accumulation after death led to the formation of varieties of *limestone.* Depending partly on a water depth that varied with time, the sea floor was intermittently covered by a variety of rocks that included organic-rich muds, mostly of Jurassic and Cretaceous age, but also some Triassic formations, which later became the source of hydrocarbons (oil and gas) now stored in porous carbonate rocks (limestones and *dolomites)* (see Table 1). Reservoir rocks range in age from the Late Permian (Khuff Formation) to the Jurassic, where the Arab reservoirs are important, and Cretaceous (Shuaiba, Mauddud and Mishrif), to the Lower Tertiary (Pabdeh Formation). Seals, preventing the relatively buoyant hydrocarbons from escaping to the sea floor, cap the reservoirs. The best of these are *evaporites* such as *gypsum* and *anhydrite* inter-bedded with the different Arab reservoir horizons, or the overlying latest Jurassic Hith Formation (Al Silwadi et al. 1996). These seals were probably deposited on extensive coastal *sabkha*s similar to those now found along the shore and on the offshore islands of Abu Dhabi (Alsharhan & Whittle 1995).

For source rocks to become *mature* and give up their oil, they need to be buried to a depth where the temperature approaches that of boiling water (about 3 km, depending on the local *temperature gradient* through the underlying rock sequence). At a depth of around 4 km, it starts to become mature for gas production but post-mature for the generation of oil, and by

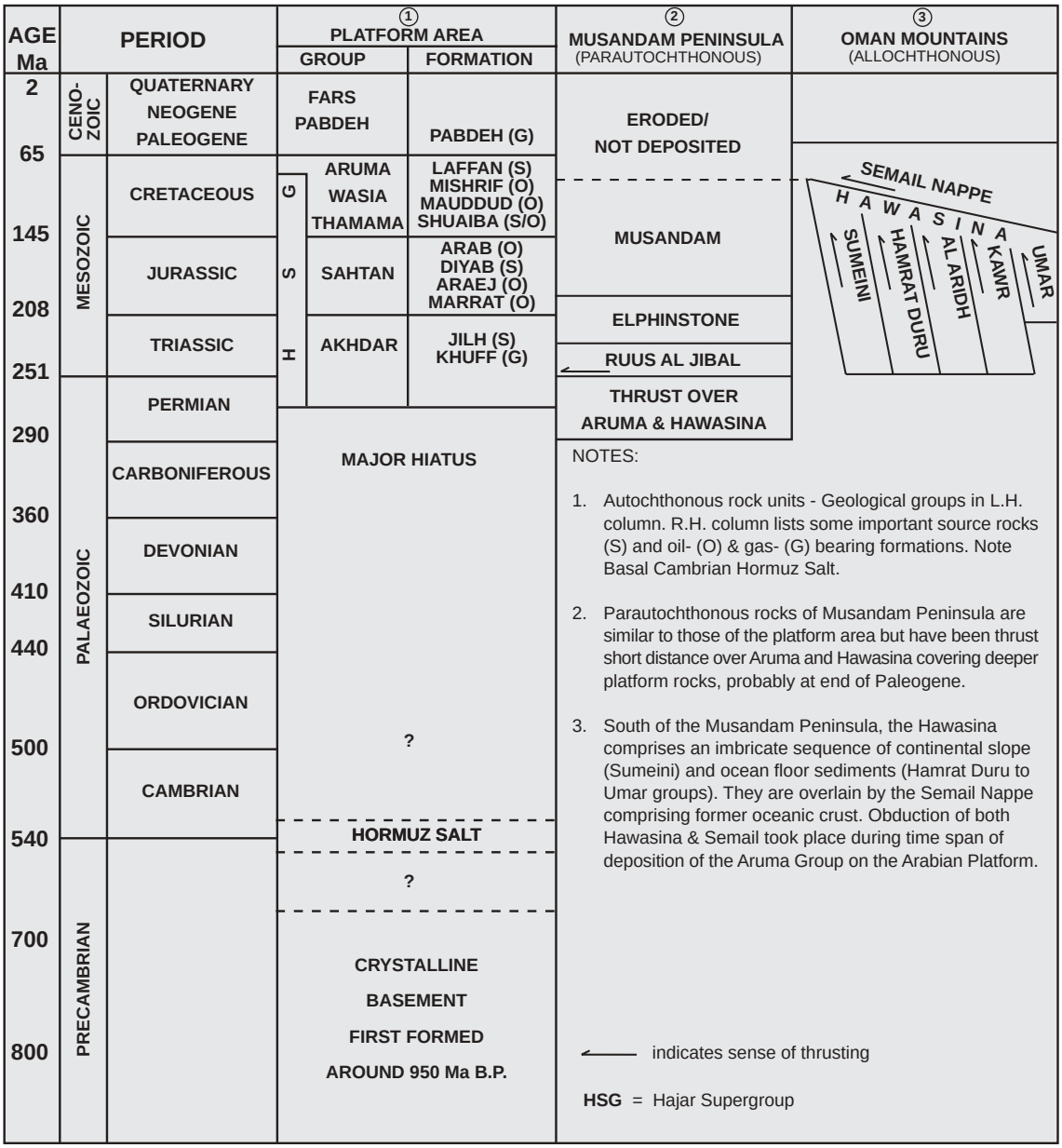

Table 1. Rock units of the United Arab Emirates. *A simplified outline emphasizing differences between the Oman Mountains and subsurface of the desert plains. Some important oil and gas horizons within the autochthonous Hajar Super Group of the Arabian Platform are shown (R= reservoir rock; S= source rock and C= cap rock or seal). Note that the Hawasina and Semail Nappes were obducted onto the Arabian continental margin during the Late Cretaceous.*

6 km, the temperature is so high (around 180°C) that even gas generation ceases (post-mature for gas). Newly generated oil is squeezed out of its source bed and migrates (usually upward) into a porous reservoir rock (e.g. sandstone, dolomite). The oil or gas can be retained in the reservoir rock only if it is kept in by an impervious *cap rock* or *seal*, and the reservoir/seal couplet forms a trap. Structural deformation of the reservoir/seal couplets, preventing the formation of traps, can occur in a variety of ways; these can include fault movement at basement level, which affects all overlying rocks, differential compaction of underlying sands and shales and, most prominently in the southern Gulf area, diapiric uplift of the Eo-Cambrian

Hormuz salt and its sideways withdrawal from the deep salt horizon to feed that diapirism (Fig. 3). A simple outline of the maturation and migration of hydrocarbons from source rock to reservoir and trap is given in Glennie (1995). For a general discussion of Arabian petroleum geology, see Beydoun (1991) and more specifically for the Emirates, Alsharhan (1989).

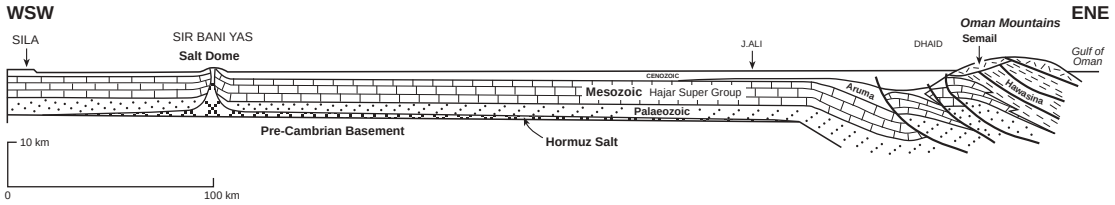

Fig. 3. Schematic W-E geological cross-section through the United Arab Emirates. Deformation leading to the creation of hydrocarbon traps within the Hajar Super Group resulted from movements associated with basement faults and the Hormuz salt (small diapir at J. Ali not shown) generally too small to show at scale of section. The nappes of the Oman Mountains were obducted when the eastern margin of Arabia and adjacent ocean floor attempted to underthrust oceanic crust now represented by the Semail Nappe.

The Oman Mountains

The origin of the subsurface rocks that underlie the greater part of the Emirates has been told in relatively simple terms, but that of the mountains is much more complex and its interpretation is not without controversy (Robertson and Searle 1990; Glennie 1995). Its presentation thus requires more space.

The creation of the Oman Mountains is closely connected with the plate-tectonic processes mentioned above. This hypothesis is based on two observations:

- The continents are composed of relatively thick (20–70 km), light and buoyant crust (*continental crust)*, while the oceans are floored by a thinner (4–10 km), denser crust (*oceanic crust*); both 'float' on a slightly plastic *mantle* that is capable of flowing as a slow-moving convection current under the influence of radioactive heat generated in the core of the Earth.
- New oceanic crust is created from molten *magma* filling tension gashes within existing crust and extruded as lava on the ocean floor at *mid-ocean ridges,* while a similar amount of older crust is carried back down into the Earth's mantle at arcuate oceanic trenches (*subduction zones)*; thus the Earth's circumference remains more or less constant as the continents and adjacent oceanic crust move away from the 'spreading' oceanic ridges and converge elsewhere at subduction trenches.

Perhaps the clearest example of the above processes is seen today on either side of the Americas. In the Atlantic Ocean, depending on location, the Americas have been moving away from Europe and Africa at an average rate of about 5 cm a year for the past 60 to 100 million years (60–100 Ma) or more, the axis of spreading being the submarine Mid Atlantic Ridge; while at the western margin of South America, oceanic crust of the Pacific Plate is being *subducted* beneath the Andes (see e.g. Glennie 1992, 1995).

For much of the Palaeozoic era, Gondwana was separated from Asia by a major ocean known as Tethys (Fig. 2). In the Late Permian, some 260 or 270 Ma BP, a continental block comprising Anatolia, Central Iran, Helmand (south Afghanistan) and perhaps Tibet, separated from the Arabian-Indian margin of Gondwana to form a *microcontinent* (Glennie 1995: Fig. 16).

The intervening area became floored by a relatively narrow spreading ocean called Neo-Tethys 1 (sequentially, there were two), which probably was rather like the modern Red Sea. Although there are some doubts about the oceanic nature of its underlying crust (it may have been 'thinned' and volcanically ruptured continental crust (Béchennec et al. 1988, 1990)), Neo-Tethys 1 seems to have had a spreading life of probably less than 50 Ma, for, in the Late Triassic, the newly formed microcontinent was itself split into two by a new axis of spreading and the creation of another ocean (Neo-Tethys 2: Fig. 4) that was to exist for over 100 Ma. Neo-Tethys 1 ceased to spread from then on. The southward narrowing microcontinent between the two oceanic areas, Neo-Tethys 1 and 2, comprised Anatolia, the Sirjan-Sanandaj zone of Iran (Glennie et al. 1990; Glennie 1995), and possibly a number of mountain-size 'fragments' of shallow-marine limestone and marble within the Hawasina Series referred to as 'Exotics' (Al-Aridh and Kawr groups of Table 1); exotic because these whitish marbles look out of place in their surroundings of the much darker rocks of the adjacent *Semail Napp*e (former oceanic crust) and the deep-water sediments (limestone and red-brown *chert;* see below) of the *Hawasina Series.*

The Hawasina comprises sequences that vary in thickness from about 1000 to 200 m and range in age from the Triassic (locally mid Permian) to the mid Cretaceous. The thinner and, more particularly, the uppermost parts of the sequences are commonly distorted and tightly folded. Furthermore, a large part, or even the total sequence, is commonly repeated in an imbricate fashion (like a row of books on a shelf, all leaning in one direction) as they partly overlie each other. A simplified picture of sedimentation on the ocean floor can be deduced by reconstructing the imbricate pile back into their original positions relative to each other (Glennie et al. 1973, 1974, 1995 Fig.8).

When Neo-Tethys 1 formed, its floor was covered with sediments derived from the edge of the Arabian continental shelf; at the continental shelf edge, shallow-marine organisms, including calcareous grasses, thrived in well-oxygenated waters, and shells or, in the case of the grasses, lime mud, accumulated when they died. The shells were partly fragmented by wave action and also by burrowing organisms. The whole formed a metastable mass of sediment that could be dislodged by the shock of an earthquake or even a violent storm. Such dislodged sediment would slide down the continental slope and develop into a relatively high-velocity flow called a *turbidity current,* which finally deposited its entrained sediment over the lower *continental rise* and *abyssal plain* of the ocean as a bed called a *turbidite.* Turbidity currents have been recorded in modern environments at speeds of up to 70 km/hour (Holmes 1978), and their momentum carries them far across the abyssal plain.

At depths greater than some 3000 to 4000 m, calcium carbonate is unstable. The fine calcareous muds that settle out from suspension in the oceanic waters are especially susceptible to replacement by silica to form reddish brown cherts (a rock rather like flint), which are characterized by the siliceous framework of very small unicellular creatures called radiolaria (i.e. they form radiolarian cherts). Turbidites and radiolarian cherts make up much of the Hawasina sedimentary sequence. The volumetrically greater calcareous turbidites dominated deposition closest to the Arabian continental shelf edge, while the much thinner red cherts were in the deepest water farthest from the shelf edge (Glennie et al. 1973, 1974; Glennie 1995).

In complete contrast to the turbidites and cherts, the 'Exotics' form large blocks of white shallow-marine limestone, commonly recrystallized to marble (a process that destroyed many

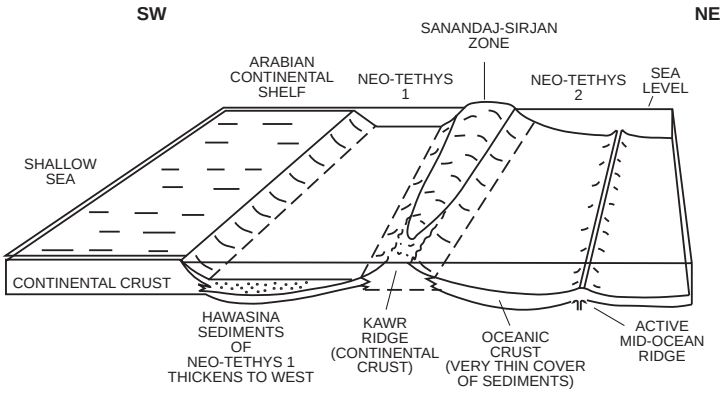

Fig. 4. Block diagram to illustrate the spatial relationships between the Arabian continental margin, Neo-Tethys 1 and 2, and the intervening Sirjan-Sanandaj-Kawr microcontinent during the Jurassic and Early Cretaceous.

of the fossils that may have been present initially). The 'Exotics' seem to have been derived from the far side of Neo-Tethys 1 relative to the Arabian continental margin (Kawr Ridge on Fig. 4). Most 'Exotics' are underlain by an association of a red siltstone and *pillow lavas* formed by extrusion of lava at the sea floor. At Jebel Rann, south-west of Dibba, however, 'exotic' limestone overlies Ordovician sandstone, which indicates the presence of continental crust. These observations suggest that the 'Exotics' probably formed as the outcome of continental break-up and the creation of a new intervening ocean. The largest known 'Exotic' in the mountains is Jebel Kawr, in Oman, which is almost 1000 m thick and over 25 km across.

The Anatolia-Sirjan-Sanandaj microcontinent that separated Neo-Tethys 1 and 2 narrowed southward (Fig. 4), and along much of the Oman coastline of Arabia was probably represented by little more than the 'Exotic' Limestones (Kawr Ridge). As the Kawr Ridge had little or no exposure above sea level, it generated no sediment by erosion other than carbonate fragments; thus this part of Neo-Tethys 2 was deprived of sediment other than a rain of the finest clay-size particles settling out of suspension in the oceanic waters and eventually forming radiolarian chert (Umar Group, Table 1).

Sedimentation in the relatively narrow Neo-Tethys 1 took place from the Late Permian to the mid Cretaceous, and, in Neo-Tethys 2, from the Late Triassic until the mid or Late Cretaceous. As Neo-Tethys 2 continued to widen, so the Africa-Arabian and adjoined South American portions of Gondwana moved to the west or south-west away from the Neo-Tethyan axis of spreading. Sometime during the Early Cretaceous, however, Africa and South America began to separate to create the intervening South Atlantic Ocean (Glennie et al. 1990; Glennie 1995). South America continued to move to the west, but Afro-Arabia had to reverse its sense of motion and move away from the South Atlantic spreading axis. With Neo-Tethys 2 continuing to spread, very strong compressional stresses soon developed. These were relieved by the creation of an easterly-dipping trench down which the oceanic crust of first the western part of Neo-Tethys 2 and then Neo-Tethys 1 was subducted. During that process, the sediments covering the floor of both Neo-Tethys 1 and 2 were scraped off the down-going oceanic plate to form the *accretionary wedge* of imbricate sequences of the Hawasina mentioned above (Glennie et al. 1990; Glennie 1995).

Subduction zones are of two types (see Fig. 6 in Glennie 1995):

- Andean Type: oceanic crust at the eastern edge of the Pacific Plate is currently being subducted beneath the Andes mountain range. As the sedimentary cover is scraped off the down-going oceanic crust, the Andes are elevated a little more. The uppermost sediments

being subducted are considerably younger than the overlying rocks of the Andes mountains; moisture associated with the descending plate lowers the melting point of rock and causes volcanic activity (together with the intrusion at depth of granite) in the overlying Andes.

- Ocean-ocean subduction: the oceanic crust of Neo-Tethys 2, when initially subducted, was possibly up to 100 Ma old and had therefore had enough time since its formation at a spreading ridge to cool down. The old and cold crust was relatively dense, and preferred to descend steeply rather than at a gentle angle; this, in turn, caused the axis of bending to roll back away from the subduction trench, thereby creating crustal tension in a geological structure that had developed initially because of crustal compression. Crustal tension inevitably leads to volcanic activity and the creation of new oceanic crust; this new oceanic crust became the Semail Nappe of the Oman Mountains (see Lippard et al. 1986).

Because the new axis of spreading developed behind the subduction trench, the newly created oceanic crust is said to have resulted from *back-arc spreading.* It is noteworthy here that the newly formed oceanic crust was younger than most of the ocean-floor sediments that were being subducted nearby.

Subduction of the oceanic crust and the growth of an *accretionary wedge* of ocean-floor sediments beneath the future Semail Nappe began some 110 Ma BP (Lippard et al. 1986). The difficulty of trying to 'swallow' the thick 'exotic limestones' down the subduction trench can be imagined from the amount of recrystallization and fracturing that affected the limestones; they were sheared from their mixed continental and ocean-margin substrate. When, later, the even thicker continent margin of Arabia reached the subduction trench, it could neither be sheared off nor 'swallowed'; it became jammed within the upper part of the subduction zone, and subduction ground to a halt.

The South Atlantic Ocean continued to widen, however, and the back-arc spreading axis just east of the subduction trench was still active. Compressional stresses built up until another subduction trench formed further to the east. In the Oman Mountains, the Late Cretaceous timing of nappe emplacement (*obduction)* can be dated by the fossil content of the Aruma Group sediments (Table 1) being deposited adjacent to the nappes being emplaced. In the Inner Makran of Iran, the presence of volcanic bombs in slightly younger Late Cretaceous marine sediments indicates that a new subduction process had already been in progress there for a few million years (Glennie et al. 1990). The Makran subduction trench is still active today, and has built an accretionary wedge of marine sediments that extends to the present southern coastline of Iran east of the Straits of Hormuz.

When the new subduction trench formed in Iran, compressive stresses in the Oman Mountains sector were removed, allowing the leading edge of the Arabian continent to rise isostatically (like a piece of wood being released under water), causing the separation of what now became the Semail Nappe from its formerly contiguous oceanic crust of back-arc type. This uplift caused the accretionary wedge of Hawasina sediments, together with the Semail Nappe, to slide a little further onto the essentially immovable *autochthonous* continental shelf sequence, the whole process being known as *obduction.* At this time (end Cretaceous), the Hawasina and Semail did not form a high mountain range, but rather an island chain, the flanks of which were covered by Early Cenozoic shallow-marine limestones that extended westward across the rest of the Emirates.

Uplift into the present mountain range did not begin until about the end of the Paleogene or early Neogene, possibly as a result of continental collision between Arabia and Iran

associated with the opening of the Red Sea and perhaps of other plate movements including that of India. As part of this event, the highland area of Ru'us al-Jibal (Fig. 1) was pushed westward slightly and compressed along a series of reverse faults, and now at the mountain edge locally overrides Paleogene strata in the subsurface (Fig. 3); other examples of the structural style can be found in Boote et al. 1990 and Dunne et al. 1990. This compression is clearly expressed by the steep western flank of the coastal mountain just north of Sha'am. East of Ra's al-Khaimah, in the Hagil *Window* just north of the exit of Wadi Bih, the shallow-marine rocks of the Ru'us al-Jibal and Elphinstone groups can be seen to overlie units of the Hawasina with a thrust contact. The amount of horizontal over-thrusting is believed to have been no more than a few kilometres and does not extend south of Dibba.

The surface of Jebel Hafit, just south of Al Ain, consists of Lower Cenozoic limestones and marls that have now been deformed into a sharp, steeply flanked anticline whose axis plunges to both north and south. The time of its deformation is believed to have coincided with uplift of the Oman mountains, possibly by reactivation of one of the underlying thrust planes within the Hawasina. Further north, Jebel Faiyah forms a similar structure that has been dissected sufficiently to expose underlying rocks of the Semail Nappe. Cenozoic rocks are also exposed along the mountain edge to the east and north-east of Jebel Hafit (e.g. Jebel Qamar).

Along the coast of Oman in the vicinity of Muscat, and to the south-east almost as far as Sur, are a number of elevated horizontal wave-cut terraces, up to 150 m above present sea level, which indicate that the Oman Mountains have continued to rise during the past few million years or so. A similar terrace in the northern Emirates has been cut into the western edge of the southern Ru'us al-Jibal, south of the exit of Wadi Bih (due east of Ra's al-Khaimah). In contrast, the northern extremity of the Oman Mountains is being depressed below sea level as its offshore continuation across the Straits of Hormuz is subducted beneath the Makran coast. According to Vita Finzi (1979), the northern tip of the Musandam peninsula is subsiding at the very rapid rate of about 6 mm per year.

The rate of horizontal closure between Arabia and Asia is not known. That it continues to do so, even if relatively slowly, is attested by the many violent earthquakes experienced in Iran as the outer edge of the Arabian Plate (north-east edge of the Zagros Mountains) grinds against the adjacent Sanandaj-Sirjan Zone; geologists have aptly named this earthquake-prone contact the Crush Zone.

Miocene Terrestrial Sediments of Western Abu Dhabi

At the time of continental collision between Arabia and Asia during the early Miocene (early Neogene), shallow-marine sedimentation was replaced by terrestrial conditions over much of the Gulf region. In western Abu Dhabi, the Shuwaihat Formation comprises deformed evaporitic sediments that are replaced upwards by dune sands which, like those of today, were deposited under the influence of a northern (*shamal*) wind; the sands are riddled with the moulds of plant roots (Glennie and Evamy 1968), which indicate the former proximity of the water table at fairly shallow depth. Among other places, such sediments are exposed on Shuwaihat island, at Jebel Dhanna and south of Sila (Fig. 1).

With an erosional interval representing several million years, the dune sands are overlain by fluvial gravels and sands of the Baynuna Formation (Fig. 1), which contain a wide variety of vertebrate fossils of both terrestrial and aquatic types: crocodile, turtle, hippopotamus, an early type of elephant, buffalo and ostrich, as well as smaller mammals (Whybrow and Hill 1999). The change from arid dune and *sabkha* to the more humid conditions needed for the hippopotamus and crocodile to thrive requires a considerable change in climate, a change that seems to have taken place repeatedly during the past million years or so. The erosional time gap between the Shuwaihat and Baynuna formations is possibly the result of a considerable fall (100 m?) in global sea level when Antarctica used that volume of water to form its thick cover of ice.

Quaternary Sediments of the Emirates

The influence of high latitude glaciations on Arabian deserts

During the past million years or more, one event has repeatedly affected global climate, including that of tropical deserts. With a cyclicity of around 100 ka (100,000 years), the whole of Scandinavia and the northern half of North America, including Greenland, suffered a repeated slow build-up of an ice cover up to two or three kilometres thick, which then melted very rapidly (Shackleton 1987; Boulton 1993); because global temperatures were lower during glaciations, many highland areas became the sites of mountain glaciers, whereas the ice cap over Antarctica, which had been a permanent feature of the southern hemisphere from at least the Miocene onward, only expanded and contracted in size.

Apart from lowering global temperatures, these glaciations affected climate in two other ways:

- Because the ice caps became the centres of very large areas of high atmospheric pressure, all other air-pressure belts around the globe were squeezed towards the low-pressure equatorial area. With isobars much closer together than is the case today, global winds will have been much stronger and more persistent than any we now experience.
- So much water went into building the ice caps that global sea level at the last glacial maximum, about 20 ka BP, was some 120 or 130 m lower than today's. Since the floor of the Arabian Gulf is everywhere less than 120 m deep, during glacial maxima the exposed floor of the Gulf would have been the site of sand dunes migrating southward and across the Emirates into the Rub' al-Khali under the influence of the northern (*shamal)* wind; the only sign of water in the Gulf area would have been in the combined Tigris-Euphrates river, which derived its water from the wetter Anatolian highlands and reached the open sea south of the Straits of Hormuz.

The high-latitude glaciations took some 80 to 100 ka to reach their maximum extent; the last then melted within little more than 10 ka to produce a global sea level similar to the present one by about 6 ka BP; thus sea level rose at an average rate of about 1 cm per year but possibly exceeded 4 cm/year for short periods (Boulton 1993). This flooding is thought to have been the origin of the biblical story of 'Noah's Flood', perhaps around 9 ka BP (Teller et al. 2000). Noah is thought to have lived in an area now covered by the Arabian Gulf. Over the almost flat floor of the Gulf, any continuous rise in sea level would have been noticed by the people living there. Noah's family possibly lived in the drier environment of a gentle rise to escape the effects of a rainfall that was considerably higher than any experienced today. As sea level

rose in the Gulf, Noah's slightly elevated pasturage would have been cut off from the mainland and then be seen to shrink in area, leading to the need for a barge or raft if he and his family and flocks were to survive the encroaching sea; necessity is the mother of invention.

Many desert areas, including much of the Sahara, had a higher rainfall between about 10 and 6 ka BP. This induced the growth of much more vegetation, which fed abundant game, leading to the term 'Climatic Optimum'; since then, most topical deserts have become more arid again (e.g. Petit-Maire 1994).

Flooding of the Gulf had a profound effect on the Emirates. Instead of sand dunes migrating freely into the area from the north, the supply of wind-driven sand was progressively cut off by the increasing extent of sea water. The wind continued to blow, however, so that in areas close to the expanding sea, sand was deflated (removed by wind action) down to the level of the water table, which was rising in concert with the rising sea level. The resulting moist surface developed into *sabkhas*, which are described later.

Fluvial sediments

When there is sufficient rainfall, fluvial gravels and sands are transported down the mountain sides and across the valley floors within the mountains; today, such rainwater reaches the sea about once in every ten years in the northern emirates, but south of Jebel Faiyah it always dissipates within the sand dunes that block the lower reaches of the wadis and never reaches the sea.

West of the mountains is a broad sheet of fluvial sands and gravels that spread for a considerable distance beneath the present cover of dune sands. In south-east Oman, the same spread of *alluvial fans* reaches as much as 200 km south of the mountains; in the north, they extend beneath the floor of the Arabian Gulf. The time of deposition of some of the younger gravels now exposed in incised wadi banks have been dated at around 30,000 and 70,000 thousand years before present (30 and 70 ka BP), while others, in Wadi Dhaid for instance, coincided with the Climatic Optimum (Sanlaville 1992). The fans have been subjected to repeated deflation, however, and near-surface sediment has been dated at over 400 ka, while the degree of alteration of some ophiolite-rich fluvial sediment suggests deposition up to a million or more years ago. The extent of these sediments, and the size of the pebbles and boulders found in them, indicate that at the time of their deposition there was much more rainfall over the area than is experienced today. The surfaces of such alluvial fans are exposed between some of the large linear dunes of the eastern emirates (Fig. 1).

Quaternary fluvial sediments are rarely exposed between the dune cover of most of the western emirates. Along the western side of Sabkha Matti, however, at the western limit of Abu Dhabi, another sequence of fluvial gravels is exposed at the surface. The attitude of the bedding laminae indicates that there, an ancient river flowed towards the north or north-east. The types of rock (e.g. limestone, volcanic lava) represented by the pebble content of the gravels point, in this case, to a source in the south-western highlands of Saudi Arabia. The time of their deposition has been dated at over 200 ka BP (Goodall 1995), which obviously was another period of higher rainfall than now.

Sabkhas

Sabkhas are flat areas of sand, silt or clay that are covered by a crust of salt (halite) for at least a part of the year. *Coastal sabkhas* may be flooded by the sea during storm and spring

high tides, whereas the inland variety has no direct marine influence but derives its moisture from rare rainfall and the proximity of the water table at shallow depth, within *capillary* reach of the surface.

Coastal sabkhas and lagoons

As already mentioned above, coastal *sabkhas* formed when the supply of wind-driven sand from the north was cut off during the post-glacial flooding of the Gulf and deflation removed dry sand down to the level of the water table. Water evaporates from the damp surface, especially during the hot summer months, which becomes saturated with halite (common salt) that crystallizes to form a hard crust. Beneath the surface, calcium sulphate also becomes concentrated and forms a mush of gypsum crystals about 50 cm below the surface. At ground temperatures greater than about 42°C, the water of crystallization is driven from the gypsum crystal lattice to create anhydrite. Shinn (1983) has many illustrations of *sabkhas* in the emirates and other areas of the Gulf.

Perhaps the most characteristic feature of a coastal *sabkha* is a widespread mat of thin, black, algae. Most of the time, this *algal mat* is dry, and commonly cracked and curled up at the edges like flakes of mud in a dried-out pond. During high spring tides, however, or when storm winds drive sea water over the almost horizontal *sabkha* surface, the algae spring to life and regenerates into a slimy, wrinkly, rubbery layer. The slimy surface traps fine calcareous particles carried over the surface by the waves, and when it cracks and curls, wind-blown sand and silt can be trapped beneath its edges; with time, the *sabkha* again acquires a crust of halite.

When halite crystallizes, it does so by growing horizontally rather than by increasing its thickness vertically. A space problem ensues, which is resolved by the salt sheets over-thrusting each other if thin, or by forming polygons (ideally hexagons) as it grows thicker.

Coastal *sabkhas* cover the surfaces of much of the extensive system of low islands south-west and just to the north-east of Abu Dhabi island. Along the coast, especially of Umm al-Qaiwain and Ra's al-Khaimah, however, the development of longshore bars has resulted in the creation of a series of shallow lagoons, which have tidally formed deltas at their mouths (Glennie 1970: Figs 98–100). Wave action builds the longshore bars into beaches, from which sands (mostly the wave-broken remains of shells and carbonate skeletons of sea grasses) are blown into the lagoon behind. In addition, as small carbonate-shelled creatures die, they leave their shells on the lagoon floor, which becomes shallower and eventually builds up to, or even above, normal high-tide level, and then acquires its own cover of coastal *sabkha* including a mat of black algae. North of Ra's al-Khaimah town, the longshore bars formed the sites of small fishing communities, which progressively moved seaward as each site became separated from the sea by the next bar to extend northward.

Inland sabkhas

Inland *sabkhas* differ from the coastal variety in having no direct marine influence on their development. Their supply of water comes from rare rainfall and the presence of a water table within capillary reach of the surface; a balance is achieved between evaporation and deflation at the surface and the supply of water from below which can trap wind-blown sediment, both being affected seasonally. Algae may be present, but extensive algal mats are not well developed; like coastal *sabkhas*, gypsum crystals form a layer below the surface.

Within the Emirates, extensive inland *sabkhas* are found in three areas: at the landward margins of the coastal *sabkhas* beyond the reach of storm tides and extending into some adjacent interdune areas; in the large broad interdune areas between the huge dunes of Al Liwa; and in Sabkha Matti, a low lying area in the far west of Abu Dhabi, about 60 km across and extending south from the coast for almost 150 km, much of it being within Saudi Arabia. The surface of Sabkha Matti is still no more than 40 m above sea level some 100 km south of the coast.

In the Liwa area, small flat-topped hills (*mesas)* are capped by a gypsum-cemented layer indicative of former *sabkha* conditions. Lightly cemented dune sand, whose bedding attitudes indicate sand transport towards the south south-east (the same as today) is exposed in the flanks of these mesas; similar dune sands can be seen in pits dug below the gypsum-cemented surface of the interdune *sabkhas*, which are at an elevation of some 80 to 90 m above sea level. The time of deposition of the dune sands has been dated as 12 ka (in pits) and 40 and 141 ka BP in the mesas, thereby indicating that both dune and *sabkha*-producing conditions have been repeated in the area; the younger dune sands were preserved by the rise in the level of the water table during the melting of the last high-latitude ice caps. In Sabkha Matti, the deflated relics of former dunes surrounded by damp *sabkha* indicate that, prior to the last rise in the level of the water table, this area also was the site of dunes migrating southward away from the present Arabian Gulf. Both the Sabkha Matti and Liwa *sabkhas* are products of the present high water table, which is associated with the current interglacial high sea level. During glaciations, *sabkhas* occurred in neither inland nor current coastal areas.

The *sabkha* is a dangerous place and chances should never be taken with one, its salt-encrusted surface often looking deceptively firm. Beneath the thin crust of the coastal *sabkha* the algal mat and underlying mush of gypsum crystals and clay-size carbonate has little bearing strength. Unwary humans are likely to break through the surface and sink to their knees, especially if the crust is new, while narrow-tyred vehicles can become a total loss. Inland *sabkhas* are little safer. A bedouin tribesman in search of fresh pastures after rain, is likely to test the feasibility of crossing a suspect surface by sending first sheep and goats in the care of young light-weight children, followed in turn by himself with the heavier camels, and then his wife driving a laden Toyota Landcruiser pickup truck.

Sand dunes

Away from the Oman Mountains and the Abu Dhabi coastline, the surface of the Emirates is dominated by the presence of sand dunes. *Dunes* migrate in the direction of the sand-transporting wind. With a *linear dune*, this is achieved by the movement of sand along the dune flanks and deposition (causing elongation) at its down-wind end; if the up-wind supply of sand ceases for any reason (e.g. flooding of the Gulf), that end of the dune 'shrivels' and the dune shortens as sand is removed and not replaced. The same principle applies to *transverse dunes*, but because their long axes are at right angles to the wind, sand is transported over the top of the dune to its leeward side (where it forms an *avalanche slope* with a maximum inclination of 34°) rather than around its flanks. Where the supply of sand is limited, crescent-shaped *barchans* are formed; here, in addition to the movement of sand over its crest to the avalanche slope, sand is also readily transported along the dune flanks, which are drawn out into the long 'horns' that point down wind. On a much smaller

scale, the axes of *ripples* are always at right angles to the wind that formed them, so their distribution gives an indication of the pattern of wind flow over and around the dune.

Across central Abu Dhabi, a broad belt of large, partly eroded (deflated) north-west to south-east trending linear dunes skirt the north-east margin of the Liwa, and lose their linear character as the Oman border is approached; this is re-established where the dunes overlie the alluvial fans that flank the Oman Mountains (Fig. 1). To the north of Jebel Hafit, the dune axes swing towards the north-east as the mountains are approached (Besler 1982). These variable trends are thought to outline the fairly constant direction of dune-forming winds at, or shortly after, the peak of the last glaciation; since that time, the outlines of the dunes have been modified but the basic plan is still recognizable. Fitting into the same wind pattern are the giant *barchanoid* dunes (up to 150 m above the interdune *sabkhas*) of the Liwa. The axes of these dunes are also transverse to the dune-forming wind, which blew towards the south south-east. Travelling further to the west, the modern (and perhaps also the ancient) winds blow increasingly towards the south, eventually to veer south-westward across the central Rub al-Khali towards the mountains of Yemen. This semi-circular pattern is typical of what are known as *trade wind deserts* (following the same sort of path as the trade winds sought by sailing ships heading westward to the Americas) such as the Sahara or, in the southern hemisphere, the Australian desert.

The broad pattern of large dunes outlined above has been modified by the effects of changing sea level in the Gulf. When sea level rose at the end of the last glaciation, the supply of aeolian sand from the north was stopped. Although the wind still blew, its direction was out of equilibrium with the geometry of the existing dunes, so their shape became modified; these modifying winds apparently were not so strong as formerly, so the new resulting dune forms were smaller than the pre-existing large dunes. This can be seen by the belt of small transverse dunes that drape the northern and north-eastern margins of the Liwa.

Over the course of recent history, the trade winds have not been so constant in direction as one might imagine. Today's strongest sand-transporting wind (the northern *shamal*) at Abu Dhabi airport has shifted about 30° to the north relative to its Glacial equivalent, and the winds are more variable than they used to be. This variability is indicated by small west-east trending linear dunes that cross the interdune areas of the Awir oasis in southern Dubai, for instance, and other similar areas further north; it is also indicated south-west of Jebel Hafit by star-shaped peaks on some of the large linear dunes, which form when winds blow in more than one direction. Today's more variable dune pattern is thought to be a product of a wind system that is weaker than it was in Glacial time.

Every time the Arabian Gulf was flooded by the sea, shallow-marine organisms flourished and eventually died, many leaving the evidence of their former existence on the sea floor in the form of calcareous shells. When the Gulf floor was exposed to the wind during sub-polar glaciations, the smaller of these shells were transported southward to the Emirates where they formed carbonate dunes. Similar dunes near the coast of north-western India are known as 'miliolite' after their content of miliolid foraminifera, and the same name has been applied in south-eastern Arabia. Inland from the coast, miliolite is widely exposed, in many cases within the core of, or adjacent to, modern dunes (e.g. draping exposures of the Baynuna Formation in western Abu Dhabi, from Silmiya south to Hameem,at the eastern end of the Liwa, or the Abu Dhabi – Al Ain road south-east of Bani Yas). Along the Hameem road, two sequences of miliolite are separated by evidence of a wetter climate; the lower sequence has a depositional age of 99

ka BP and the upper of 64 ka BP, times when the sea surface was about 25 and 80 m, respectively, below the present level of the Arabian Gulf. A study of the bedding attitudes of the miliolite indicates variations in wind direction similar to those deduced for the modern dunes (Glennie 1994).

It is clear that the dune systems of the Emirates have been controlled not only by global shifts in wind direction, but also by glacially controlled changes in exposure of the Gulf floor, which in turn have controlled the distribution of both coastal and inland *sabkhas*. Those dunes and *sabkhas* are still reacting to today's climate and associated wind directions.

Brief History of the Quaternary in the Emirates

The early Quaternary history of the Emirates is very poorly known. The limited evidence from sparsely dated alluvial fans suggests that it was probably a time of much higher rainfall than now. By about a million years ago, or perhaps as late as half a million years BP, near-polar glaciations led, in the Gulf area, to cyclic repetitions of lower sea level and stronger winds that caused sand dunes to migrate southward, with the warmer interglacials giving higher rainfall and less active dunes. For the past 5000 years, we seem to have been heading slowly in the direction of increased aridity associated in the long term (80,000 years later?) with another full glaciation in high-latitude areas.

Conclusion

By extrapolation from elsewhere, the geological history of the Emirates and adjacent areas of Arabia over the past 600 million years or so seems to have been mostly one of relative stability. Following tropical shallow-marine conditions of sedimentation in the late Precambrian, the area was largely terrestrial during much of the succeeding Palaeozoic time span. Deep erosion preceded the Permian separation of a microcontinent from the eastern margin of Arabia; the following marine transgression was associated with the successive creation of Neo-Tethys 1 and 2. Throughout most of the Mesozoic era, the Emirates was the site of shallow-marine sedimentation except in the two branches of Neo-Tethys, where deep-marine deposition took place. This situation was brought to an end by closure of Neo-Tethys 1 and 2, and the obduction of deep-oceanic sediments and a slice of newly formed back-arc oceanic crust onto the Arabian continental margin to form an island arc. The succeeding shallow-marine limestone deposition was terminated in the east when the Oman Mountains began to be uplifted into a high range some 30 Ma BP, but stable conditions of sedimentation continued over the bulk of the Emirates until major glaciations began to induce lower global sea levels perhaps some two to five million years ago and created the present land surface. Near-polar glaciations have controlled sea level in the Arabian Gulf for at least the last 500,000 years, thereby also controlling the supply of dune sand from the north or the cutting off of that supply, with the resulting widespread deflation and creation of *sabkhas*.

Glossary of Geological Terms

abyssal plain: the almost horizontal floor of an ocean between the continental slope and mid-ocean ridge, commonly found at depths in excess of 4000 m.

accretionary wedge: a wedge of sedimentary rocks that was scraped off the surface of a down-going plate during subduction.

aeolianite: a consolidated sedimentary rock formed of wind-deposited sand; commonly, but not necessarily, rich in carbonate grains.

algal mat: a sheet of rubbery algae that covers the coastal *sabkha* surface after flooding.

allochthonous: term implying derivation or transport from elsewhere; the Hawasina and Semail are allochthonous because they did not originate where now found.

alluvial fan: a fan-like spread of fluvial distributary channels, commonly at the junction of mountain and plain; fans coalesce along the length of the Oman Mountains.

anhydrite: an evaporite mineral composed of calcium sulphate, $CaSO_4$, found in some sedimentary rocks. Often derived from *gypsum* by losing its *water of crystallization.*

autochthonous: a term implying an origin where now found, i.e. not transported from elsewhere. Noun: "autochthon".

avalanche slope: also known as **slip-face.** The slope that forms when wind-blown sand from the windward side of a dune passes into the calm air of the leeward side. The sand will start to slip if further deposition would result in the maximum angle of repose for dry sand of 34^{o} being exceeded.

back-arc: the arcuate area 'behind' the hanging wall of a subduction zone; it may be subjected to either compression or extension.

back-arc spreading: the process of creating new oceanic crust in the back-arc area behind a subduction trench.

barchan: see **dune.**

barchanoid dunes: see **dune.**

BP: abbreviation of Before Present, often given in Ka, thousands (K) of years (a).

capillary: resembling a hair; of very small bore. If a tube of very small bore is immersed in water, the water will rise up within the tube as a result of capillary attraction.

cap rock/seal: an impervious rock (seal) overlying a fluid-bearing reservoir.

carbonate: general term for calcium and magnesium carbonates (limestones and dolomites).

carbonate-compensation depth: the depth below which most carbonate particles become unstable and slowly dissolve.

chert: beds of finely crystalline deep-water silica.

Climatic Optimum: the state of an ideal climate; inferred for existing desert regions to have had sufficient annual rainfall to render the area an ideal place for man to live. Such conditions are thought to have prevailed over much of the Saharan and Arabian deserts between about 9000 and 6500 years ago.

continental crust: the lighter (less dense) of the two main types of the Earth's crust, which forms most land masses but may extend below shallow seas.

continental shelf: that part of the sea floor between the coast and the marked change in slope at the shelf edge, whose depth averages about 120 m. Continental shelves vary in width from a few kilometres to over 1000 km.

continental slope & rise: the two form the slope (upper part, to perhaps 1500 m) of the ocean floor between the continental shelf edge and the abyssal plain at depths of about 4000 m or more.

convection current: the transfer of heat from one part of a fluid or gas to another by flow of the fluid or gas from the hotter parts to the colder. A fluid will rise if heated from below because, through expansion, it becomes less dense than the cold.

deflation: the blowing away of dry fine-grained rock material (sand and dust), by the wind. A form of aeolian erosion at work chiefly in deserts.

diapir, diapirism: salt (halite) is less dense than most other rocks and is easily deformed. When buried at depth, salt is more buoyant than overlying rocks; it may then withdraw sideways to create a vertical bulge (salt pillow) that deforms overlying strata into anticlines and, by breaking through them, create salt domes and even salt walls. This process is known as diapirism; the product of diapirism is a diapir.

dolomite: a calcium-magnesian limestone, commonly formed by alteration of shallow-marine limestone.

dune: accumulation of wind-blown sand that possesses one or more slipfaces. Its size is dependent on the availability of sand and the ability of the wind to carry sand to the top without removing it again. The finest sand grains are usually found at the crest. There are several types of dune but only those common in eastern Arabia are described here.

barchan: crescent-shaped sand dune, which migrates downwind in the direction of its horns. It has a gentle windward slope and a slipface on its lee slope. Barchans sometimes unite laterally to form rather irregular *barchanoid dunes.*

barchanoid dunes: cross between a *barchan* and a *transverse dune.*

linear dune: dune whose long axis is parallel to the prevailing dune-forming wind; it grows by extending downwind. Avalanche slopes, where present, are almost parallel to the axis of the dune and can face towards either flank. May occur as a swarm of parallel dunes as in the Rub al Khali or the Wahiba.

megadune: any large dune whose height exceeds about 60 m and has a crestal spacing of about 500 m or more. Most are thought to have formed during the last major glaciation.

star dune: a roughly star-shaped pyramidal dune with three or more radiating arms with slip faces. Thought to form where seasonal winds are strongly oblique to each other. May result also by modification of older transverse or longitudinal dunes.

transverse dune: a dune whose long axis is at right angles to the prevailing dune-forming wind. Likely to break up into barchanoid and then barchan dunes if the supply of sand is not maintained.

evaporites: minerals, mostly anhydrite, gypsum or halite (common salt), that are typically formed in areas where the rate of evaporation exceeds that of rainfall or fluvial influx (i.e. in desert areas).

Gondwana: an ancient mega-continent named after the Gond tribe of northern India. Comprised Antarctica, Australia, India, Afro-Arabia and South America. It began to split up into its modern components in the later Mesozoic.

gypsum: an *evaporite* mineral, Calcium Sulphate ($CaSO_4$.- $2(H_2O)$), typically found just below the surface of coastal and inland *sabkhas.* Alters to *anhydrite* when it loses its *water of crystallization.*

Hawasina: an imbricate wedge of sediments of mid Permian to mid Cretaceous age that were deposited over the floor of Neo-Tethys 1.

hydrocarbons: any organic compound comprising carbon and hydrogen, usually refers to oil and gas.

Ka: abbreviation for thousands (**K**) of years (**a).**

limestone: calcium carbonate ($CaCO_3$), mostly of biogenic origin, and largely formed in shallow seas.

linear dune: see **dune.**

Ma: abbreviation for millions (**M**) of years (**a**).

magma: molten rock when still within the Earth's crust or mantle.

mantle: the part of the Earth, nearly 3000 km thick, that underlies crust of both continental and oceanic type.

maturation, maturity: the process of 'ripening' a source rock to the state where it generates oil or gas; the state of a source rock with respect to its ability to generate oil or gas. Considered to range from immature, before any oil or gas has been generated, through mature to post-mature, when no additional oil or gas can be generated from it.

megadune: see **dune.**

mesa: a mesa is a flat-topped plateau bounded on at least three sides by steep, commonly cliffed slopes. The bedding is normally horizontal. A **butte** is a very small mesa. Both are found in the Miocene strata of western Abu Dhabi.

microcontinent: a sub-continent or continental sliver calved from a major continental plate by processes of crustal separation and spreading.

mid-ocean ridge: a (mostly) submarine ridge that transects an oceanic area and is a locus of generation of new oceanic crust.

migration: the passage of a newly generated oil or gas out of a source rock (primary migration), and its movement via rock conduits to other locations, including hydrocarbon traps (secondary migration).

nappe: a large sheet-like rock unit that has been tectonically emplaced (thrust) over a dominantly sub-horizontal or low-angle floor (e.g. Semail Nappe of Oman Mountains); at the contact, older rocks overlie younger rocks, which is the reverse of what happens during deposition of normal sedimentary sequences.

nappe emplacement (obduction): the placing of a nappe above another (usually autochthonous) rock unit without implying whether this relationship was the result of over-thrusting or underthrusting.

Neo-Tethys I: that part of the ancient ocean Tethys formed when the Sirjan-Sanandaj microcontinent separated from the eastern (Arabian) margin of Gondwana.

Neo-Tethys 2: the ocean that separated Central Iran from Siran-Sarandaj.

obduction: the process by which former oceanic crust or a wedge of oceanic sediments comes to lie upon crust of continental type.

oceanic crust: the type of crust that characteristically underlies the Earth's oceans; it is denser than continental crust.

ophiolite: obducted oceanic crust, now separated from previously contiguous crust of oceanic type.

parautochthonous: a rock unit that is not quite autochthonous, and has undergone some (thrust) transport; e.g. the Ru'us al-Jibal rock units.

pillow lava: the pillow-like masses of rock that form when magma is extruded below water and chilled rapidly.

plate: one of the major areas of the Earth's crust, normally comprising continental and contiguous oceanic crust.

plate tectonics: the processes by which the Earth's crustal plates are formed and interact with each other.

porosity: the pore spaces within a rock; in oil fields, these pores are filled with oil or gas.

reservoir, reservoir rock: any rock that can contain moveable fluids in its pore spaces.

ripple: a surface undulation, generally of unconsolidated sand, whose wavelength depends on wind strength and is constant with time. The ripple axis is always transverse to the wind. The coarsest grains are found at the crest.

The ripple height depends on the range of grain sizes present and the wind strength.

***sabkha*:** a flat area of clay, silt or sand, commonly with crusts of salt. Subdivided into:

1) **coastal *sabkha*:** a coastal flat at or just above the level of normal high tide. Its sediments consist of sand, silt or clay and its surface is often covered with a salt crust formed by the evaporation of water drawn to the surface by capillary action or from occasional marine inundations. The coastal *sabkha* is characterized by the presence of algal mats and the occurrence of gypsum and anhydrite within its sediment. It is subject to *deflation* down to the water table.

2) **inland *sabkha*:** a flat area of clay, silt or sand, commonly with saline encrustations, that is typical of desert areas of inland drainage and some interdune areas. Their salts may be formed by evaporation of surface water, or of water drawn to the surface from the water table by capillary action.

salt dome: a dome-shaped structure caused by the upward penetration of a circular plug of salt, commonly 1-2 km in diameter, through overlying strata; the plug may also give strata through which it fails to penetrate a domal shape.

Semail Nappe: the name given to the huge ophiolite nappe of the Oman Mountains.

Semail ophiolite: the huge ophiolite slab of the Oman Mountains typically comprising peridotites and harzburgites, partly serpentinized, gabbros and basaltic pillow lavas.

***shamal*:** Arabic word for north: applied to north or northwest wind that blows down the Arabian Gulf and clockwise across the Rub al-Khali.

star dune: see **dune.**

source rock: a rock rich in organic matter which, if heated sufficiently, will generate oil or gas.

subduction: the process at a plate margin of crustal consumption down a subduction zone.

subduction zone: a sloping linear zone down which crust and overlying sediment of mostly oceanic type passes into the mantle beneath the edge of another plate, commonly but not exclusively of continental type.

temperature gradient: the change in temperature measured over a given distance; usually measured in °C/km. Often used to calculate depth at which source rocks become mature.

thrust: a reverse fault or slide plane, on which older rocks have been emplaced over younger ones.

thrust sheet: a sheet of rock that has been tectonically emplaced over a younger rock sequence, the two units commonly being separated by a relatively low-angle thrust plane: a nappe.

Trade Wind Desert: a term sometimes applied to those deserts in subtropical land areas that are crossed by the *trade winds*.

transverse dune: see **dune**.

trap: any deformation (fold, fault, wedge-out) of a reservoir rock/seal couplet that can cause hydrocarbons to be trapped as they migrate from their source rocks.

turbidite: the sedimentary deposit that settles out from a turbidity current; its sediment is commonly graded from coarse at the base to fine at the top.

turbidity current: high velocity current of relatively dense turbid sediment and water that occasionally flows across the floor of some ocean basins from a site usually high on the adjacent continental slope.

wadi: desert watercourse, dry except after rain, or a valley where water may continue to flow intermittently.

water of crystallisation: the water present in hydrated compounds such as gypsum ($CaSO_4.2H_2O$). If the temperature of the gypsum crystal is raised above about 50°C, either by deep burial or by near-surface heating in a desert, it loses its water of crystallisation ($2H_20$) and becomes the anhydrous mineral *anhydrite (*$CaSO_4$).

window: an area where erosion has cut down through a thrust plane to expose the underlying rocks: e.g. Hagil Window in the south-west Ru'us al Jibal.

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Before the Emirates: an Archaeological and Historical Account of Developments in the Region c. 5000 BC to 676 AD

D.T. Potts

Introduction

In a little more than 40 years the territory of the former Trucial States and modern United Arab Emirates (UAE) has gone from being a blank on the archaeological map of Western Asia to being one of the most intensively studied regions in the entire area. The present chapter seeks to synthesize the data currently available which shed light on the lifestyles, industries and foreign relations of the earliest inhabitants of the UAE.

Climate and Environment

Within the confines of a relatively narrow area, the UAE straddles five different topographic zones. Moving from west to east, these are (1) the sandy Gulf coast and its intermittent *sabkha*; (2) the desert foreland; (3) the gravel plains of the interior; (4) the Hajar mountain range; and (5) the eastern mountain piedmont and coastal plain which represents the northern extension of the Batinah of Oman. Each of these zones is characterized by a wide range of exploitable natural resources (Table 1) capable of sustaining human groups practising a variety of different subsistence strategies, such as hunting, horticulture, agriculture and pastoralism. Tables 2–6 summarize the chronological distribution of those terrestrial faunal, avifaunal, floral, marine, and molluscan species which we know to have been exploited in antiquity, based on the study of faunal and botanical remains from excavated archaeological sites in the UAE. Unfortunately, at the time of writing the number of sites from which the inventories of faunal and botanical remains have been published remains minimal. Many more archaeological excavations (Fig. 1) have taken place which have yielded biological remains that have not yet been published. Nevertheless, a range of sites with a published floral and faunal record already exists which extends from the late prehistoric era of the fifth/fourth millennium BC to the first few centuries AD, and these leave us in no doubt that the pre-Islamic inhabitants of the region exploited a very wide range of plants, animals, fish and shellfish. So far from being an inhospitable desert, the land and waters of the modern UAE presented its ancient inhabitants with an enormous variety of exploitable, economically important resources.

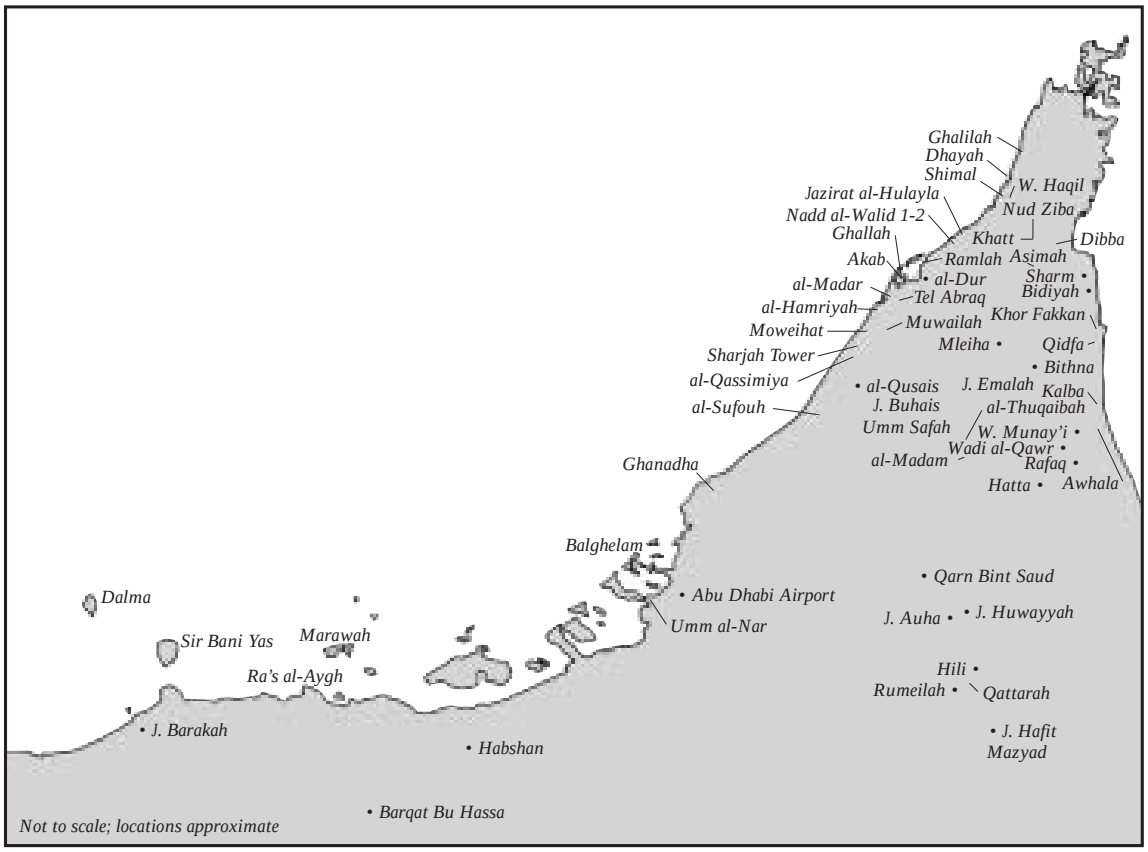


Fig. 1. Map of the UAE, showing the approximate locations of the archaeological sites mentioned in the text.

Table 1. Environments and resources of significance in the past found in the UAE

Resource Category	Gulf Coast	Desert	Interior Piedmont	Mountains	Eastern Piedmont
Faunal	fish shellfish dugong cormorant marine turtles whales and dolphins	small mammals gazelle camel	camel	small mammals freshwater fish	fish shellfish marine turtles crabs
Floral	mangrove fodder plants fuel plants medicinal plants	fodder plants fuel plants medicinal plants timber	cultivars fodder plants fuel plants fuel plants medicinal plants	timber cultivars fodder plants fuel plants medicinal plants	grazing plants timber fodder plants
Mineral	sandstone beach rock lime pearls shell	sandstone	well-drained soils	limestone igneous rock copper iron soft-stones	igneous rock limestone shell
Water	brackish	brackish	abundant	abundant	abundant
Resource Utilization	fishing pearling limited gardening pastoralism	pastoralism oasis horticulture	agriculture horticulture pastoralism	horticulture pastoralism hunting	horticulture pastoralism fishing

Table 2. Mammalian fauna attested on archaeological sites in the UAE

Species	Late Prehistoric	Umm al-Nar	Wadi Suq	Iron Age	Mleiha/al-Dur
MAMMAL (wild)					
Rodentia		Tell Abraq[1]	Tell Abraq	Tell Abraq	Mleiha[2]
rat (*Rattus rattus*)					al-Dur[3]
mouse (*Mus musculus*)					al-Dur
mouse (*Mus domesticus*)					Mleiha
Rueppell's fox (*Vulpes rueppelis*)					al-Dur
Arabian red fox (*Vulpes vulpes*)					al-Dur
					Mleiha
fox (*Vulpes* sp.)			Tell Abraq	Tell Abraq	Mleiha
gazelle (*Gazella subgutturosa*)		Tell Abraq	Tell Abraq	Tell Abraq	
		Umm al-Nar[4]			
gazelle indet. (*Gazella gazella* ssp.)	Akab[5]	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
	Dalma[6]				Mleiha
bottlenose dolphin (*Tursiops truncatus*)					
dolphin indet. (*Delphinus* sp.)	Dalma	Umm al-Nar	Tell Abraq	Tell Abraq	al-Dur
dugong (*Dugong dugon*)	Akab	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
	Dalma	Umm al-Nar?			
rorqual (*Balaenoptera*)		Umm al-Nar			
Arabian oryx (*Oryx leucoryx*)		Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
		Umm al-Nar			Mleiha
tahr (*Hermitragus jayakari*)					Mleiha
camel (*Camelus dromedarius*)		Tell Abraq	Tell Abraq		
		Umm al-Nar			
deer (*Dama mesopotamica*)					al-Dur
MAMMAL (domestic)					
Zebu (*Bos indicus*)		Tell Abraq?	Tell Abraq	Tell Abraq	
		Umm al-Nar			
taurine cattle (*Bos taurus*)		Tell Abraq?			al-Dur
					Mleiha
sheep (*Ovis aries*)	Dalma	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
		Umm al-Nar			Mleiha
goat (*Capra hircus*)	Dalma	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
		Umm al-Nar			Mleiha
canid indet.			Tell Abraq	Tell Abraq	Mleiha
dog (*Canis familiaris*)		Shimal			al-Dur
					Mleiha
donkey (*Equus* sp.)					Mleiha
equid indet.		Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
dromedary camel (*Camelus dromedarius*)			Tell Abraq		al-Dur
					Mleiha
Bactrian camel (*Camelus ferus* f. *bactriana*)					al-Dur
Camelus bactrianus x dromedarius					Mleiha

[1] Stephan 1995.
[2] Gautier 1992, Gautier and Van Neer 1999, Mashkour and Van Neer 1999.
[3] Van Neer and Gautier 1993.
[4] Hoch sp.1979, 1995.
[5] Prieur and Guerin 1991.
[6] Beech 2000.
[7] Uerpmann 1999.

Table 3. Reptiles and birds attested on archaeological sites in the UAE

Species	Late Prehistoric	Umm al-Nar	Wadi Suq	Iron Age	Mleiha/al-Dur
REPTILE (wild)					
green turtle (*Chelonia mydas*)	Akab[1]	Tell Abraq[2]	Tell Abraq?	Tell Abraq?	al-Dur[3]
	Dalma				
Chelonidae indet.	Dalma[4]				
	Mleiha[5]	Umm al-Nar			
snake indet. (*Serpentes* sp.)					Mleiha
BIRD (wild)					
Socotra cormorant					
(*Phalacrocorax nigrogularis*)	Dalma	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
		Umm al-Nar[6]			Mleiha[7]
ostrich (*Struthio camelus*)	Abu Dhabi airport[7]	Tell Abraq			Mleiha
		Abu Dhabi airport			
snake bird (*Anhinga rufa*)		Umm al-Nar			
duck (*Anas querquedula*)		Umm al-Nar			
flamingo (*Phoenicopterus* aff. *ruber*)		Umm al-Nar			
giant heron? (*Ardea bennuides*)		Umm al-Nar			
bird unident.			Tell Abraq	Tell Abraq	
BIRD (domestic)					
chicken (*Gallus gallus* f. *domestica*)					al-Dur

[1] Prieur and Guerin 1991. [2] Stephan 1995. [3] Van Neer and Gautier 1993. [4] Beech 2000
[5] Beech 1998. [6] Hoch 1979, 1995. [7] P. Hellyer, pers. comm. [8] Gautier 1992, Gautier and Van Neer 1999.

Table 4. Fish attested on archaeological sites in the UAE

Species	Late Prehistoric	Umm al-Nar	Wadi Suq	Iron Age	Mleiha/al-Dur
FISH (marine)					
Elasmobranchii	Dalma[1]				
Carcharhinidae					
requiem shark (*Carcharhinus* sp.)					
Sphyrnidae					al-Dur[2]
hammerhead shark (*Sphyrna* sp.)					al-Dur
shark indet.		Umm al-Nar[3]			
Pristidae					
sawfish (*Pristis* sp.)		Umm al-Nar			al-Dur
Dasyatidae (Trygonidae)					
stingray (*Dasyatis?*)		Umm al-Nar			al-Dur
Clupeidae					
herring (*Clupeidae* indet.)					al-Dur
Chanidae					
milkfish (*Chanos chanos*)					al-Dur
Ariidae	Dalma				
sea catfish (*Arius thalassinus*)					al-Dur
Belonidae					
needlefish (*Tylosurus crocodilus*)	Dalma				al-Dur
Platycephalidae					
flathead (*Platycephalus indicus*)					al-Dur
Serranidae					
sea bass/grouper (*Epinephelus* sp.)	Dalma				al-Dur
Carangidae					
jacks and pompanos	Dalma				al-Dur
(*Scomberoides* sp.)					
(*Seriola* sp.)					
(*Megalaspis cordyla*)					
(*Carangoides chrysophrys*)					
(*Carangoides* sp.)					
(*Caranx* sp.)					
(*Gnathodon speciosus*)					
(*Alectis indicus*)					
(*Ulua mentalis*)					
Carangidae indet.					
Lutjanidae					
snapper (*Lutjanus* sp.)					al-Dur
Gerreidae					
mojarra (*Gerres* sp.)					al-Dur
Haemulidae					
grunt (*Pomadasys* sp.)					al-Dur
Lethrinidae	Dalma				
emperor (*Lethrinus* sp.)	al-Madar?				al-Dur
Sparidae					
porgie	Dalma				al-Dur
(*Crenidens crenidens*)					al-Dur
(*Acanthopagrus berda*)					al-Dur
(*Acanthopagrus latus*)					al-Dur
(*Rhabdosargus sarba*)					al-Dur
(*Rhabdosargus* sp.)					Mleiha
(*Argyrops spinifer*)					al-Dur
Sparidae indet.	al-Madar?				al-Dur
Ephippidae					
spadefish (*Platax* sp.)					al-Dur
Mugilidae					
mullet (*Mugilidae* indet.)					al-Dur
					Mleiha
Sphyraenidae	Dalma				
barracuda (*Sphyraena* sp.)					al-Dur
Scaridae	Dalma				
parrotfish (*Scarus* sp.)					al-Dur
Siganidae					
rabbitfish (*Siganus* sp.)					al-Dur
Scombridae	Dalma				al-Dur
bonito/tuna (*Euthynnus affinus*)	Dalma				al-Dur
					Mleiha
tuna (*Thunnus* sp.)					al-Dur
					Mleiha
Tetraodontidae					
puffer (Tetraodontidae indet.)					al-Dur
fish indet. (still under study)		Tell Abraq[5]	Tell Abraq	Tell Abraq	
FISH (freshwater)					
Cyprinidae					
barbel (*Barbus* sp.)					al-Dur
Crustaceans					
crab et al. (still under study)	al-Madar Dalma	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur Mleiha

[1] Beech 2000.
[2] Van Neer and Gautier 1993.
[3] Hoch 1979, 1995.
[4] Uerpmann and Uerpmann 1996.
[5] Stephan 1995.

Table 5. Plants and cultivars attested on archaeological sites in the UAE

Species	Late Prehistoric	Umm al-Nar	Wadi Suq	Iron Age	Mleiha/al-Dur
FLORA (wild)					
Apocynaceae					
oleander (*Nerium oleander*)					Mleiha[1]
Asclepiadaceae					
Sodom's apple (*Calotropis procera*)					Mleiha al-Dur
Avenaceae					
oat (*Avena* sp.)		Hili 8			
Avicenniaceae					
mangrove (*Avicennia marina*)			Tell Abraq?		
white mangrove (*Avicennia marina*)		Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
Chenopodiaceae					
goosefoot (sp. indet.)		Hili 8[2]			Mleiha
Leguminosae					
acacia indet. (*Acacia* sp.)		Hili 8[3]		Muwailah	Mleiha
gum arabic (*Acacia nilotica*)					Mleiha
sissoo (*Dalbergia sissoo*)		Tell Abraq			Mleiha[4] al-Dur
prosopis (*Prosopis cineraria*)				Muwailah	Mleiha
Oleaceae					
ash (*Fraxinus* sp.)					Mleiha
Pinaceae					
Aleppo pine (*Pinus halepensis*)					al-Dur
Platanaceae					
oriental plane (*Platanus orientalis*)					Mleiha
Polygonaceae					
Calligonum sp.		Hili 8			
Rhamnaceae					
Christ's thorn (*Ziziphus spina-christi*)	Dalma[5]	Hili 8[6] Tell Abraq	Tell Abraq	Tell Abraq Muwailah	Mleiha[7]
Rhizophoraceae					
extinct mangrove	Dalma	Tell Abraq	Tell Abraq	Tell Abraq	Mleiha al-Dur
Solanaceae					
desert thorn (*Lycium* sp.)					Mleiha
Tamaricaceae					
tamarisk (*Tamarix* sp.)		Hili Tell Abraq	Tell Abraq	Tell Abraq Muwailah	Mleiha
FLORA (domestic)					
wheat (*Triticum* sp.)		Umm al-Nar[8]			Mleiha
emmer wheat (*Triticum dicoccum*)		Hili 8			
bread wheat (*Triticum aestivum*)		Tell Abraq[9] Hili 8	Tell Abraq		
barley (*Hordeum* sp.)		Umm al-Nar			Mleiha
2-row hulled barley (*H. distichon*)		Hili 8			
6-row hulled barley (*H vulgare*)		Tell Abraq Hili 8	Tell Abraq	Tell Abraq	
6-row naked barley (*H. vulgare* var. *nudum*)		Hili 8			
date palm (*Phoenix dactylifera*)		Tell Abraq Dalma[10]	Tell Abraq	Tell Abraq	Mleiha
		Hili 8		Muwailah[11]	al-Dur
melon (*Cucumis* sp.)		Hili 8			

[1] Tengberg and Potts 1999.
[2] Coubray 1988, Tengberg 1998.
[3] Tengberg 1998.
[4] Cleuziou and Costantini 1980, Cleuziou 1989, Potts 1994b, Tengberg 1998.
[5] Tengberg 1998.
[6] Cleuziou and Costantini 1980, Cleuziou 1989, Potts 1994b.
[7] Coubray 1988.
[8] Willcox 1995.
[9] Willcox and Tengberg 1995.
[10] Beech and Shepherd, in press
[11] Tengberg 1998.

Most, if not all, of the flora and fauna utilized by the pre-Islamic population of the region is still to be found in the area. This is not an unequivocal indication that no climatic change has taken place since the prehistoric past, but it is certainly an indication that the changes which have taken place have been minor rather than major ones. At the height of the Flandrian Transgression, c. 4000 BC, sea level in the Arabian Gulf reached its peak around .5m higher than it is today (Lambeck 1996), and until c. 3000 BC a more humid environment prevailed, largely as a result of wind systems which were weaker than those at present, 'permitting convection-induced thunder storms in coastal and mountainous areas' (Glennie et al. 1994: p 3). After 3000 BC today's arid regime set in and although there have been minor climatic adjustments since that time, it is safe to say that the basic pattern observable in the region today has prevailed for the past five millennia.

Table 6. Molluscan fauna attested on archaeological sites in the UAE

Species	Late Prehistoric	Umm al-Nar	Wadi Suq	Iron Age	Mleiha/al-Dur
Marine Bivalves					
Acar plicata					Mleiha
Alectryonella plicatula					Mleiha[1]
Amiantis umbonella		Tell Abraq[2]	Tell Abraq Shimal[3]	Tell Abraq	Mleiha
Anadara sp.					Mleiha
Anadara antiquata			Shimal		Mleiha
Anadara ehrenbergeri	al-Madar[4]			Tell Abraq Awhala[5]	Mleiha
Anadara uropigimelana					Mleiha
Anodontia edentula					Mleiha
Asaphis deflorata			Tell Abraq	Tell Abraq	Mleiha
Asaphis violascens			Shimal		Mleiha
Balanus sp.				Tell Abraq	Mleiha
Barbatia fusca				Tell Abraq	Mleiha
Barbatia helblingii			Shimal		Mleiha
Barbatia obliquata					Mleiha
Barbatia tenella					Mleiha
Barbatia sp.	al-Madar				al-Dur[6]
Callista erycina	Akab[7]	Tell Abraq	Tell Abraq Shimal	Tell Abraq Awhala	Mleiha
Callista sp.					Mleiha
Cardita bicolor					Mleiha
Cardita variegata					Mleiha
Cardita sp.					al-Dur
Certhidea cingulata		Tell Abraq			al-Dur
Chama pacifica					Mleiha
Chama sp.					Mleiha
Chlamys ruschenbergerii		Tell Abraq	Tell Abraq Shimal		Mleiha
Circe corrugata			Shimal		Mleiha
Circe sp.					Mleiha
Circenita callipyga	Dalma[8]		Shimal	Tell Abraq	Mleiha
Codakia tigerina					Mleiha
Decatopecten plica					Mleiha
Dosinia alta					Mleiha
Dosinia ceylonica					Mleiha
Dosinia tumida					Mleiha
Glycymeris sp.					al-Dur
					Mleiha
Glycymeris lividus		Tell Abraq			Mleiha
Glycymeris maskatensis		Tell Abraq	Tell Abraq Shimal	Tell Abraq	Mleiha
Isognomon legumen			Shimal		Mleiha
Laevicardium papyraceum					Mleiha
Lutraria sp.					Mleiha
Mactra lilacea					Mleiha
Marcia sp.			Shimal	Awhala	Mleiha
Marcia hiantina	Akab al-Madar	Tell Abraq	Tell Abraq Shimal	Tell Abraq Muwailah[9]	al-Dur Mleiha
Marcia opima				Tell Abraq	Mleiha
Modiolus phillipinarum					Mleiha
					al-Dur
Periglypta puerpera					Mleiha
Pinctada sp.		Tell Abraq?	Tell Abraq	Tell Abraq Awhala	al-Dur Mleiha
Pinctada margaritifera		Tell Abraq	Tell Abraq Shimal	Tell Abraq Muwailah	Mleiha
Pinctada radiata	Dalma al-Madar		Tell Abraq Shimal	Muwailah	al-Dur Mleiha
Pinna sp.			Tell Abraq		Mleiha
Pteria marmorata					Mleiha
Saccostrea cucullata	Akab Hamriyah[10] al-Madar	Tell Abraq	Tell Abraq Shimal	Tell Abraq Awhala Muwailah	al-Dur Mleiha
Sanguinolaria cumingiana			Tell Abraq		Mleiha
Solen sp.					Mleiha
Spondylus sp.			Tell Abraq	Tell Abraq	al-Dur
					Mleiha
Spondylus ?exilis			Shimal		Mleiha
Spondylus gaederopus					Mleiha
Sunetta effosa					Mleiha
Tellina sp.					Mleiha
Tivela damaoïdes					Mleiha
Tivela ponderosa					Mleiha
Tivela sp.					Mleiha
Trachycardium sp.					Mleiha
Trachycardium lacunosum			Tell Abraq Shimal	Tell Abraq	al-Dur Mleiha
Turitella sp.					al-Dur
Venus verrucosa					Mleiha
Marine Gastropods					
Ancilla castenea					Mleiha
Architectonia perspectiva			Tell Abraq?		Mleiha
Babylonia spirata					Mleiha
Bullia sp.					Mleiha
Bullia tranquebarica				Tell Abraq	Mleiha
Bursa bardeyi					Mleiha
Bursa sp.					Mleiha
Bythinia sp.					Mleiha
Cerithium sp.					Mleiha
Cerithium caeruleum					Mleiha
Cerithidea cingulata		Tell Abraq	Shimal	Tell Abraq	Mleiha
					al-Dur
Charonia sp.?					Mleiha
Clypeomorus bifasciatus					Mleiha
Conus betulinus					Mleiha
Conus cf. ebraeus					Mleiha
Conus cf. kermadecensis					Mleiha

Table 6. Molluscan fauna attested on archaeological sites in the UAE (continued)

Species	Late Prehistoric	Umm al-Nar	Wadi Suq	Iron Age	Mleiha/al-Dur
Conus flavidus					Mleiha
Conus striatus					Mleiha
Conus tessulatus					Mleiha
Conus textile					al-Dur
Conus sp.			Tell Abraq		Mleiha
Cronia konkanensis			Shimal		Mleiha
Cuma lacera		Tell Abraq?	Tell Abraq?		Mleiha
Cymatium sp.					Mleiha
Cypraea sp.			Tell Abraq		al-Dur
					Mleiha
Cypraea arabica			Tell Abraq		Mleiha
Cypraea clandestina				Awhala	Mleiha
Cypraea caurica					Mleiha
Cypraea gracilis					Mleiha
					al-Dur
Cypraea grayana				Awhala	Mleiha
Cypraea aff. *lentiginosa*					Mleiha
Cypraea turdus		Tell Abraq	Tell Abraq		al-Dur
			Shimal		Mleiha
Engina mendicaria					Mleiha
					al-Dur
Engina sp.					Mleiha
Fasciolaria trapezium					Mleiha
Ficus subintermedia		Tell Abraq	Tell Abraq?	Tell Abraq	Mleiha
		Jebel al-Emalah[11]	Shimal		
		al-Sufouh[12]			
Fusinus arabicus					Mleiha
					al-Dur
Lambis sp.					Mleiha
Lambis truncata sebae					Mleiha
Lunella coronatus	Dalma		Shimal		Mleiha
Monilea obscura			Shimal		Mleiha
Morula granulata					Mleiha
Murex (Hexaplex) kuesterianus	Dalma, Akab	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
	Hamriyah			Muwailah	Mleiha
	al-Madar				
Murex scolopax				Tell Abraq	Mleiha
Nassarius arcularius plicatus		Tell Abraq			Mleiha
Nassarius coronatus					Mleiha
Nassarius sp.			Shimal		Mleiha
Nerita sp.					Mleiha
Nerita albicilla					Mleiha
Neverita sp.					Mleiha
Neverita didyma			Tell Abraq	Tell Abraq	Mleiha
Oliva bulbosa		Tell Abraq	Shimal	Tell Abraq	al-Dur
					Mleiha
Patella exusta pica					Mleiha
Patella sp.					Mleiha
					al-Dur
Phalium faurotis					Mleiha
Phasianella solida			Shimal		Mleiha
Phasienella variegata					Mleiha
Planaxis sulcatus					Mleiha
Polinices tumidus					Mleiha
Polinices sp.			Shimal		Mleiha
Rapana bulbosa					Mleiha
Siratus kuesterianus			Shimal		Mleiha
Strombus decorus persicus	Dalma		Tell Abraq	Tell Abraq	al-Dur
			Shimal		Mleiha
Strombus gibberulus					Mleiha
Strombus sp.					Mleiha
Terebralia palustris	Akab	Tell Abraq	Tell Abraq	Tell Abraq	al-Dur
	Hamriyah		Shimal	Awhala	Mleiha
	al-Madar			Muwailah	
Thais mutabilis					Mleiha
Thais savignyi			Shimal		Mleiha
Thais sp.					Mleiha
Tonna sp.			Shimal		Mleiha
Tonna dolium					Mleiha
Tonna luteostoma					Mleiha
Trochus erythraeus		Tell Abraq	Tell Abraq?		Mleiha
			Shimal		
Turbo coronatus	al-Madar	Tell Abraq	Tell Abraq	Tell Abraq	Mleiha
Turbo radiatus					Mleiha
Turbo sp.					Mleiha
Turritella sp.					al-Dur
					Mleiha
Turritella cochlea					Mleiha
Turritella torulosa					Mleiha
Umbonium vestiarium			Shimal		Mleiha
Vermetes sulcatus					Mleiha
					al-Dur
Vermetus sp.					Mleiha
Scaphopods					
Dentalium octangulatum		al-Sufouh	Shimal		Mleiha
		Jebel al-Emalah			
Dentalium sp.					Mleiha
FRESHWATER MOLLUSCS					
Melanoides tuberculata					Mleiha
					al-Dur

[1] Prieur 1999.
[2] Prieur 1990.
[3] Glover 1991.
[4] Uerpmann and Uerpmann 1996.
[5] E. Thompson, pers. comm.
[6] Van Neer and Gautier 1993.
[7] Prieur and Guerin 1991.
[8] Beech and Elders 1999.
[9] E. Thompson, pers. comm.
[10] Jasim 1996.
[11] Benton and Potts, in press.
[12] Benton 1996.

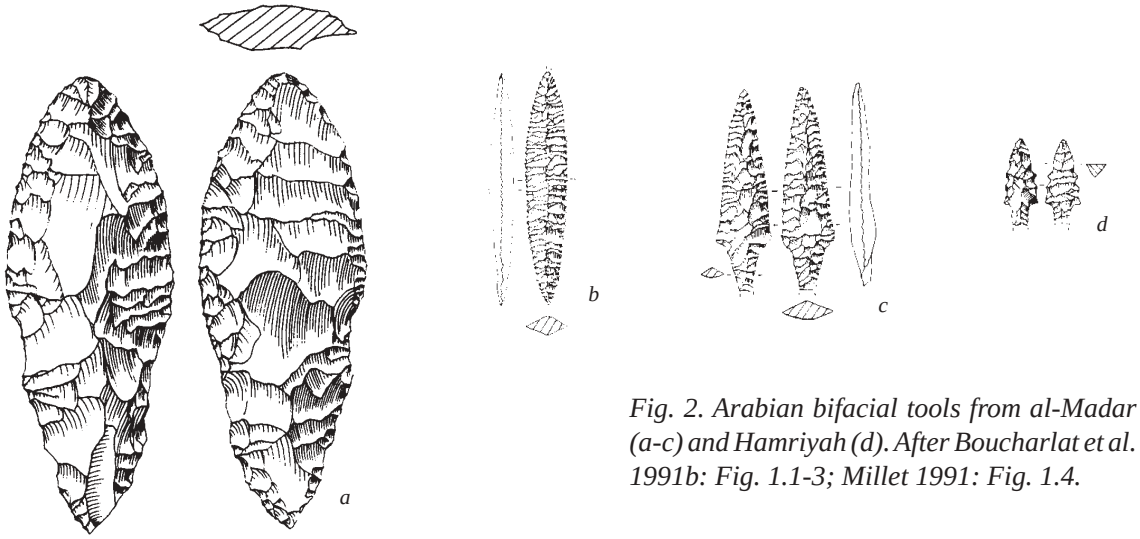


Fig. 2. Arabian bifacial tools from al-Madar (a-c) and Hamriyah (d). After Boucharlat et al. 1991b: Fig. 1.1-3; Millet 1991: Fig. 1.4.

The Arabian Bifacial Tradition (c. 5000–3100 BC)

During the last glacial maximum (from c. 68,000 to 8000 BC), winds were so strong in the desert regions of the globe that they 'probably blew at sand-transporting speeds for much of each glacial winter' in eastern Arabia causing 'severe dessication, even at reduced air temperatures, producing conditions that were probably too severe for man to tolerate' (Glennie et al. 1994: pp 2–3). This fact, perhaps more than any other, helps to explain the absence of Pleistocene hominid occupation and Middle and Upper Palaeolithic stone tool industries in the UAE. The only exception to this yet identified may come from a site at Jebel Barakah in the Western Province of Abu Dhabi where radial cores and the tip of a bifacial tool were recovered which might date to the Middle Pleistocene (McBrearty 1993, 1999: pp 382–384).

The last glaciation collapsed around 10,000 years ago, and the slightly moister conditions which ensued from c. 8000 to 3000 BC have often been described as a Climatic Optimum (Glennie et al. 1994: p 3). It was during this period that the first securely dated human settlements in the region appeared. Finely pressure-flaked, bifacial stone tools (Fig. 2) belonging to what has been called the 'Arabian bifacial tradition' have been found on a large number of sites in a wide range of environmental zones throughout the Emirates. The most important of these are listed in Table 7. Tanged points, foliates, blades, knives, drills and other tools attest to the diversity of the tool-kit of the region's first inhabitants. Affinities with material from the Eastern Province of Saudi Arabia, Qatar and Bahrain (Spoor 1997) are obvious, suggesting that the entire region may have formed a single cultural province at this time.

In other respects these areas also show shared traits. Painted pottery of Ubaid type, imported from Mesopotamia, has been found on many of the coastal sites in the UAE, eastern Saudi Arabia, Qatar, Bahrain and the islands of Kuwait, revealing the existence of contacts between these regions and the peoples of southern Iraq in the fifth millennium BC. Petrographic analysis, moreover, has confirmed that some (and most probably all) of the pottery found on the Arabian bifacial sites in eastern Saudi Arabia was imported from Mesopotamia itself, and the likelihood that such was the case in respect to the material found on sites in the UAE is equally strong (Méry 1994: p 398; Méry 1996; Méry and Schneider 1996). Be that as it may, it is important to underscore the fact that this introduction of pottery into the region did not lead immediately to the birth of a local ceramic industry, something which did not appear until the third millennium BC.

Table 7. Principal late prehistoric sites in the UAE

Location	Site	Literature
Jazirat al-Hamra	Nadd al-Walid 1-2	Gebel 1988; Glover et al. 1990; Uerpmann 1992
Ra's al-Khaimah	Wadi Haqil	de Cardi 1985; Stocks 1996
Khatt	Kh 92, 117-119, 135	de Cardi et al. 1994
Umm al-Qaiwain	al-Madar	Cauvin & Calley 1984; Boucharlat et al. 1991b; Haerinck 1994b; Uerpmann & Uerpmann 1996
	Ramlah	Uerpmann & Uerpmann 1996
	Akab	Prieur & Guerin 1991; Boucharlat et al. 1991a
	Tell Abraq	Potts 1991a
Sharjah	al-Hamriyah	Cauvin & Calley 1984; Minzoni Déroche 1985a; Haerinck 1991a; Millet 1991; Boucharlat et al. 1991a; Haerinck 1994b; Jasim 1996
	al-Qassimiya	Minzoni Déroche 1985a; Calley & Santoni 1986; Millet 1988; Boucharlat et al. 1991a
	Sharjah Tower	Millet 1988
Mleiha/	P15, 18-19,	Minzoni Déroche 1985b; Millet 1989
Jebel Faiyah	21-22, 28 Jebel al-Emalah	Charpentier 1996
Jebel Buhais	Jebel Buhais	S. Jasim, H.-P. and M. Uerpmann, pers. comm.
al-Madam	al-Madam	Gebel 1988
Qarn Bint Saud	Qarn Bint Saud	Gebel 1988
Al Ain	Jebel Huwayyah	Copeland & Bergne 1976; Gebel et al. 1989
	Jebel Auha	Gebel 1988
	Mazyad	Gebel 1988; Gebel et al. 1989
	Hili 8	Inizan and Tisier 1980
Western Region	Barqat Bu Hassa	Gebel 1988
	Habshan	Gebel 1988
	Jebel Barakah	McBrearty 1993
	Shuwaihat	McBrearty 1999
	Hamra	McBrearty 1999
	Ra's al-Aysh	McBrearty 1999
	Bida al-Mitawaa	Crombé 2000
Liwa oasis	Yaw Sahhab	Harris 1998
Abu Dhabi	Dalma	Hellyer 1993, Flavin and Shepherd 1994
islands	Marawah	King 1998, Hellyer 1998b-c
	Abu Dhabi airport	Hellyer 1998b

Contact with areas to the north may also help account for the introduction of domesticates such as sheep, goat and cattle, the wild forerunners of which were never at home in south-eastern Arabia (Uerpmann and Uerpmann 1996). All of these domesticates have been found on Arabian bifacial sites in eastern Saudi Arabia and they are present at Ra's al-Hamra 6 in Oman by the fifth millennium as well. Thus, it is likely that they were being herded on sites in the UAE by this time. As the stone tool industry found throughout eastern Arabia which precedes the bifacial tradition – known as Qatar B (but absent in the UAE) – shows clear affinities to the pre-pottery Neolithic industry of the Levant, it has been suggested that this may have been the ultimate source of both the people and the herd animals which eventually populated eastern Arabia during the earlier portion of the mid-Holocene Climatic Optimum, beginning c. 5000 BC.

The fact that the tool kit of the earliest inhabitants of the region contained numerous projectile points should not lead us to conclude prematurely that they were primarily hunters. Rather, Uerpmann and Uerpmann (1996) have stressed that herders will maximize their own flocks' secondary products – such as milk, fleece and hair – by preserving their animals and hunting to provide any meat desired. Thus, the Arabian bifacial sites may be those of herders who supplemented their diet by hunting, rather than hunters who kept a few domestic animals. The fact that ostrich eggshell fragments (Aspinall 1998, Potts in press b) have been recovered at sites with bifacial stone tools does not mean that these notoriously shy and elusive creatures were hunted, merely that their eggs, so widely used in antiquity as containers for liquids, were already being employed in this capacity at an early date.

Whether or not these groups were fully sedentary is unknown. A transhumant pattern of occupation along the coasts in the winter, when fishing (Desse 1995, Hellyer 1998a) and shellfish gathering would have been the main pursuits, and summer residence in the interior, when pastoralism and, eventually, horticulture, were practised, is entirely feasible and well-attested elsewhere in south-eastern Arabia (Lancaster and Lancaster 1992: p 345), if as yet unproven for the prehistoric UAE. Certainly this would account for the fact that coastal sites, which usually contain some areas of shell midden formation, are generally not very deep, and interior sites generally have little if any stratification. It would also account for the uniformity in the tool-kit evidenced in both the coast and the interior of the UAE.

As yet we know little about the people who inhabited the territory of the UAE at this time. Burials in an Arabian bifacial site along the coast of the Umm al-Qaiwain lagoon have been excavated but not yet published (C.S. Phillips, pers. comm.). At al-Buhais 18, H.-P. and M. Uerpmann are excavating an important aceramic site with an extensive graveyard at the foot of Jebel Buhais which dates to c. 4700 BC where the remains of domesticated sheep, goat and cattle, as well as a tool-kit of Arabian bifacial type, have been found (Uerpmann, Uerpmann and Jasim, in press; Kieswetter, Uerpmann and Jasim, in press).

The Late Fourth and Early Third Millennium (c. 3100–2500 BC)

At the end of the fourth millennium, c. 3100–3000 BC, a major suite of innovations appeared in the material culture inventory of the region. For the first time collective burials in the form of above-ground tombs (Fig. 3) built of unworked stone appear at two sites in the UAE, Jebel Hafit (including Mazyad) and Jebel al-Emalah. Named after the site where they were first discovered, these 'Hafit'-type tombs are completely without precedent in the local archaeological sequence. What is more, a number of them have yielded small, biconical ceramic vessels, many so badly preserved as to have lost their original surfaces, but on some of which a panel of painted, geometric decoration in black can still be seen (Potts 1986a). Not only are these vessels (Fig. 3) superficially reminiscent of so-called 'Jamdat Nasr' pottery from southern Mesopotamia, but analyses of examples from both Jebel Hafit (Méry 1991: p 72; Méry and Schneider 1996) and Jebel al-Emalah (unpubl.) have confirmed that this material was imported, some of it from the type site Jamdat Nasr in south-central Iraq.

Because of the fact that most of the Hafit tombs in the UAE were robbed in antiquity little data is available on their occupants (but cf. Højgaard 1985), and it is difficult to get a good idea of just how many people were normally buried within them. More than one is probably all that can be said at the moment, but, given the restricted size of their keyhole-like interior chambers, it cannot have been greater than perhaps a dozen or so. Around the keyhole a large area of mounded, unworked rock was heaped up, sometimes with a discernible 'bench' encircling the exterior. Whereas the tombs at Jebel Hafit range in size from an estimated 7 to 11 m in diameter (Frifelt 1971: p 377), the Jebel al-Emalah examples are approximately 11 to 12 m across (Benton and Potts 1994). In addition to their pottery, other imported finds of note include a class of roughly square, bone or ivory beads with two diagonal perforations. These find identical parallels in Iran at Susa, Tepe Hissar and Tepe Yahya and in Mesopotamia at Uruk, always in contexts dating to c. 3000 BC (Frifelt 1980: Pl. XVa; Potts 1993a: p 183 for full refs.).

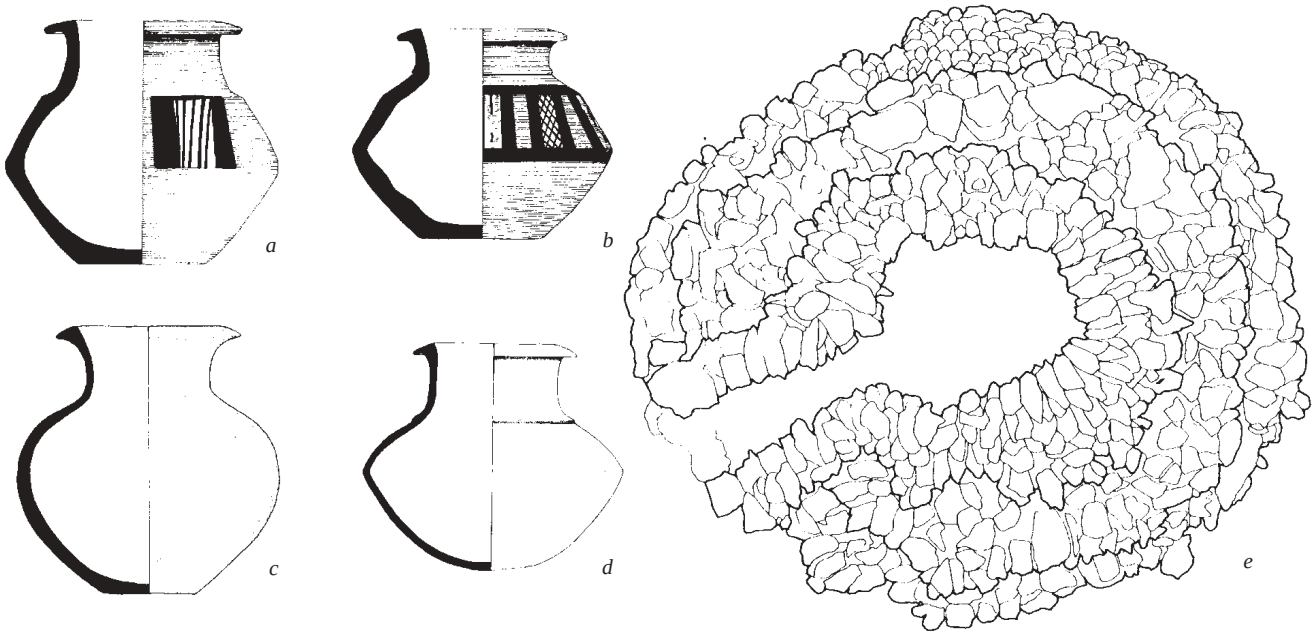


Fig. 3. Selected examples of Jamdat Nasr-type pottery (a-d) from Hafit-type tombs at Jebel Hafit excavated by the Danish expedition and a plan of one of the tombs (6.4 m. in diameter) excavated by the French mission (e). After Frifelt 1971: Figs. 12A, 17A, 22B and 22A; and Cleuziou et al. 1978: Pl. 15.

To date the settlements of the population buried in the Hafit tombs of south-eastern Arabia (examples are also found further south in Oman) have yet to be discovered. Although it has been argued by S. Cleuziou that the occupation of the settlement at Hili 8 in Al Ain began c. 3100 BC (Cleuziou 1996) there are good grounds for questioning this early date. Thus, it is striking that the two radiocarbon determinations on which this contention is based (MC–2266 and 2267) are roughly 500 years earlier than the next earliest date from the site and, moreover, both of these early dates derive from samples of wood charcoal (Potts 1997a). As experience has shown at other sites, radiocarbon determinations run on charcoal are often anomalously early because the wood in question was old by the time it was burned. Thus, for example, a ship's timber or architectural beam may have been used initially, re-cycled several times, and finally burned as fuel hundreds of years after its initial employment, unlike dates, fruit pips, matting, and other organic materials which have a much more finite lifespan. If we discount Hili 8 as a settlement which may have existed in tandem with the period in which the graves on the slopes of Jebel Hafit were built, we are left with no settlements with which to pair these important funerary monuments.

The question naturally arises why and how the contact which transmitted the Jamdat Nasr vessels from Mesopotamia to the Oman peninsula was organized. In most discussions of this phenomenon an economic motivation is ascribed to the Mesopotamian bearers of the Jamdat Nasr-type ceramics and beads which have appeared at Jebel Hafit and Jebel al-Emalah. What resources they may have been in search of is unknown, but it is generally admitted that copper from the Hajar Mountains is a likely candidate. Certainly small pins and awls of copper have been found in Hafit burials (Frifelt 1971), but it cannot always be assumed that these date to the original period in which these tombs were used, and at both Jebel Hafit and Jebel al-Emalah we have ample evidence for the later re-use of the tombs during the third, second and first millennia BC and, at the latter site, as late as the fifth or sixth century AD (see below).

More relevant, perhaps, is the fact that the earliest proto-cuneiform texts from Uruk in southern Mesopotamia which date to c. 3400–3000 BC – the so-called 'Archaic Texts' from Uruk – already contain references to 'Dilmun' copper. Dilmun was later identified with mainland eastern Saudi Arabia and Bahrain, but as there is no copper in either of these areas it has usually been assumed that the copper in question must have come from further afield. On analogy with the situation in the late third and second millennia BC the copper source most often invoked is that which stretches from Fujairah in the north (Hassan and al-Sulaimi 1979) to lower Oman in the south. Thus, although there is no proof as yet, it has generally been assumed that the motivation behind the Jamdat Nasr-period contact between the UAE and southern Mesopotamia was the incipient trade in copper.

The Mid to Late Third Millennium (c. 2500–2000 BC)

The agricultural settlement of south-eastern Arabia was predicated upon the domestication of the date palm (*Phoenix dactylifera*). Without the date palm, the shade necessary for the growth of other, less hardy cultivars, including cereals, vegetables and fruits, was lacking. Once the *bustan*-type of garden came into existence, watered by wells which tapped the relatively abundant and shallow lenses of sweet water found throughout much of the UAE, the basis was laid for the development of the kind of oasis living (Cleuziou 1996) which is so characteristic of the wadi and piedmont settlements of the region. Herd animals, such as sheep, goat and cattle, of course played a part in the development of a full oasis economy, but no single species was so critical in this process as the date palm.

The earliest villages of the UAE were thus agriculturally based, and perhaps, in order to safeguard their investment in land, water and natural resources, the inhabitants of those villages felt compelled to construct imposing fortifications. These buildings appear for the first time in the middle of the third millennium and are an architectural *leit-fossil* of the so-called 'Umm al-Nar' (Umm an-Nar) period (c. 2500–2000 BC). Like their later descendants at sites such as Nizwa in Oman, the fortress-towers of south-eastern Arabia took the form of raised, circular platforms consisting of massive crosswalls and intervening hollows filled with gravel, the entirety of which supported a surface raised up off the ground (by as much as 8 m) with a still higher, outer wall for defence. Undoubtedly small buildings stood upon these raised platforms as well. Every example excavated to date is also distinguished by the presence of a

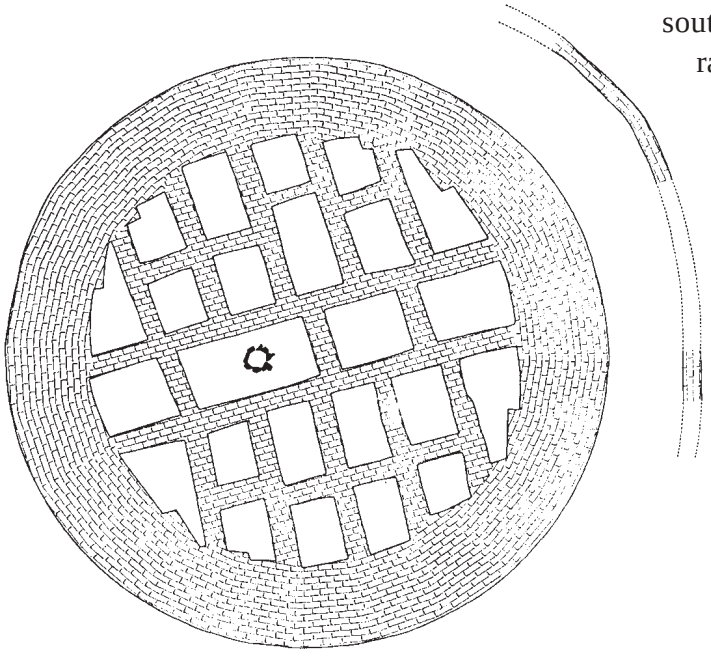


Fig. 4. The Umm al-Nar-period fortress-tower of Hili 1, 24 m. in diameter. After Frifelt 1975: Fig. 3.

well in the centre of the building, and it may be justifiably asked whether or not the entire fortress is not a 'lock' placed upon the precious water supply of the village in which the fortress was located.

In the UAE, examples of such Umm al-Nar fortress-towers have been excavated at Hili 1 (Fig. 4), Hili 8 (Cleuziou 1989, 1996), Bidiyah (Al Tikriti 1989), Tell Abraq (Potts 1990a, 1991a, 1993b, 1995a, 2000 a-b) and Kalba (C.S. Phillips, pers. comm.). Whereas most of these range in size between 16 and 25 m in diameter, the tower at Tell Abraq, at 40 m in diameter, is by far the largest yet uncovered. The social and political implications of these towers are intriguing. There is no longer any doubt that, by the late third millennium BC, the Oman peninsula was identified in Mesopotamian cuneiform sources as **Magan** (Sumerian) or *Makkan* (Akkadian). In addition to safeguarding the agricultural settlements in their environs, the towers of the Umm al-Nar period may also have been the power centres for the 'lords of Magan' against whom several of the Old Akkadian emperors, including Manishtusu and Naram-Sin, campaigned in the twenty-third century BC (Potts 1986b,). Manishtusu's allusion to campaigning against no fewer than 32 'lords of Magan' implies a decentralized political landscape at the time, and one can well imagine a situation in which petty lords, each in control of a certain amount of territory centred around a primary settlement (such as Tell Abraq, Bidiyah, Hili, etc.) dominated by a fortress-tower, banded together to repulse the Akkadian invasion of Magan. It should also be noted that unfortified settlements of a more ephemeral nature have also been discovered, particularly along the Gulf coast (e.g. at Ghanadha, see Al Tikriti 1985; al-Sufouh, see Benton 1996; at al-Dur (ed-Dur), see Boucharlat et al. 1988: pp 2–3; Abu Dhabi airport, see de Cardi 1997; and Umm al-Nar, Frifelt 1991).

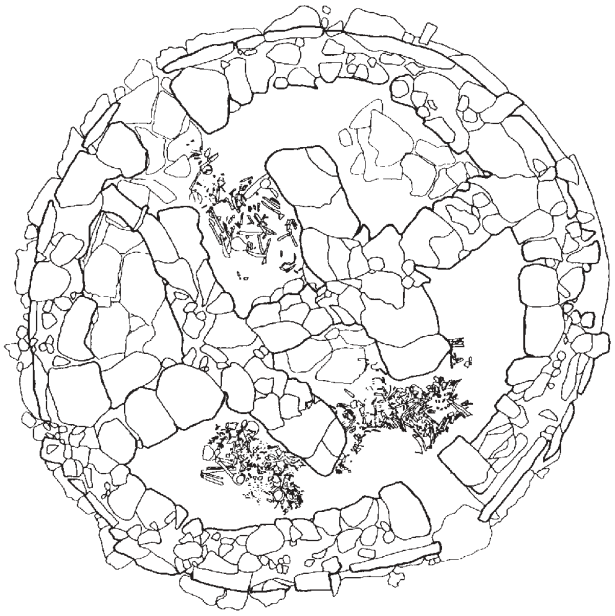


Fig. 5. The Umm al-Nar-type tomb at al-Sufouh, 6 m in diameter. After Benton 1996.

In general, the dead of the Umm al-Nar period were buried in circular, stone tombs faced with finely-masoned ashlar blocks, although rectangular chambers, perhaps for secondary reburial of bone from circular tombs which had become full, are also known (Haerinck 1990-91). Examples of Umm al-Nar circular tombs were first encountered by a Danish expedition on the island of Umm al-Nar in Abu Dhabi in 1958 (Frifelt 1991). Thus it was that the island gave its name to the period of which these tombs are characteristic. Umm al-Nar-type tombs range in size from c. 4 m to 12 m in diameter. Internally, the structures have a variable configuration of crosswalls which may either be free-standing, bounded on each end by a passage leading from one half of the tomb to the other, or joined to the external tomb wall, dividing the interior of the tomb into two halves without access to each other. By 1995, examples of Umm al-Nar tombs (Fig. 5) had been excavated in both coastal and inland Abu Dhabi (Umm

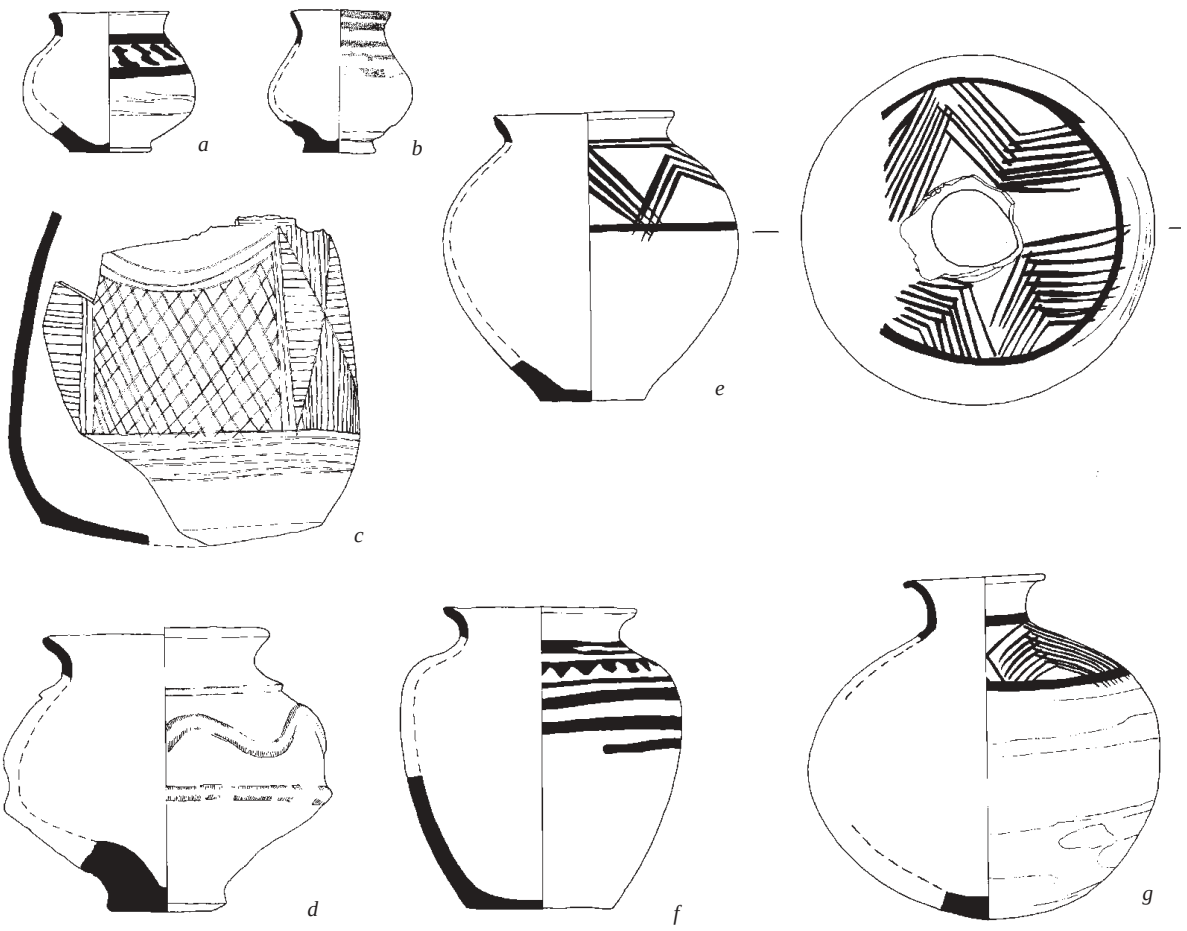


Fig. 6. A selection of Umm al-Nar-period pottery from the tomb at al-Sufouh, including black-on-grey (a-b), incised grey (c), fine tan with raised meandering ridge (d), and fine black-on-orange (e-g). After Benton 1996.

al-Nar island, Hili area), Dubai (al-Sufouh and Hatta), Ajman (Moweihat), Umm al-Qaiwain (Tell Abraq), and Ra's al-Khaimah (Shimal, Wadi Munay'i). The better-preserved examples show that literally hundreds of individuals were buried in these tombs along with a wide range of grave furniture, including soft-stone bowls (David 1990, 1996); fine and domestic black-on-red ceramics (Fig. 6) of local manufacture (Frifelt 1990; Méry 1997); incised grey and painted black-on-grey pottery (Fig. 6) from south-eastern Iran or Baluchistan (Cleuziou and Vogt 1985; Benton 1996; Potts 2000, in press a); copper-bronze weaponry (daggers, spearheads; Potts 1998; Pedersen and Buchwald 1991; Weeks 1997, 1999, 2000, on Umm al-Nar-period metallurgy); personal items of jewellery such as bracelets and necklaces incorporating thousands of beads, a significant proportion of which are Harappan paste micro-beads from the Indus Valley (Benton 1996); and other exotic items such as ivory combs (Potts 1993d; Potts 2000 a-b), gypsum lamps (Potts 1995a), and linen (Reade and Potts 1993).

Like their Hafit counterparts, many Umm al-Nar-period tombs were robbed in antiquity, but those excavated at Umm al-Nar, Hili North (Tomb A), Tell Abraq, Shimal, Moweihat and al-Sufouh have yielded substantial quantities of human skeletal remains which are beginning to provide important evidence on the diet and health of the late third millennium population

of the Oman peninsula (Blau 1996, 1998; Blau and Beech 1999). Furthermore, they reveal that all age grades, from foetal infants to elderly adults, were interred together in these tombs. One of the most intriguing questions concerns the relationship between the individuals buried in the different chambers of a tomb. Recent analyses of the epigenetic traits on teeth (cf. Højgaard 1980) from three of the tombs excavated by the Danish expedition on Umm al-Nar indeed supports the idea that the individuals buried within a single tomb were genetically related, probably representing members of closely inter-married families (Alt, Vach, Frifelt and Kunter 1995).

Palaeopathological inferences can also be drawn from an analysis of Umm al-Nar-period skeletal remains. At Tell Abraq, for example, A. Goodman and D. Martin have studied thousands of bones from a minimum of 394 individuals (Potts 2000b) interred in a tomb dating to c. 2100–2000 B.C. (Potts and Weeks 1999). Some of the preliminary conclusions of their work may be summarized as follows:

> *Periostitis and osteomyelitis, both of which result from non-specific infections such as staph and strep, are found on roughly half of the tibia recovered. Signs of trauma in the form of healed and unhealed lesions (mainly on the hands, ribs, and forearms) and osteochondritis dessicans (lesions which develop in response to trauma to joint systems) were detected on roughly 5% of all skeletal elements. Osteoarthritis was found in a significant proportion of the adult population. Fluorosis (exaggerated bone formation at muscle and ligament attachments) and anemia of unknown origin leading to perotic hyperostosis (thickening of the cranium) were also found. Turning to the dental evidence, fluorosis is suggested by dental mottling in a large portion of the dental finds. Attrition was extremely severe, as was caries in certain individuals, and enamel hypoplasisas (severe enamel growth disruption due to infection) were common among children* (Potts 1993b: p 121).

Perhaps most surprising in the tomb at Tell Abraq was the discovery, amongst otherwise disarticulated bone, of a unique, fully articulated female aged c. 20. 'Abnormal upward curvature of the spine of about 30˚ beyond normal, early osteoarthritis changes in the right knee and ankle, a mild deformity of the left foot and mild changes in the right foot' suggest that 'the female was sedentary, overused her right leg and had a neuromuscular imbalance of the lower left leg. It further suggests the individual suffered from a neurological disease of several years'

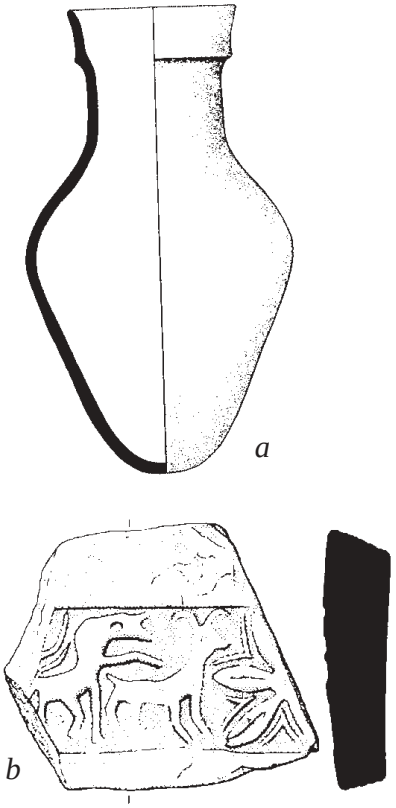


Fig. 7. An Early Dynastic III-type, Mesopotamian storage jar from Grave 1 (a) and a cylinder seal-impressed sherd (b) from the settlement on Umm al-Nar. After Frifelt 1991: Fig. 86 and 1995: Fig. 255.

Fig. 8. The ivory comb from the late Umm al-Nar-period tomb at Tell Abraq.

duration which led to partial crippling' ('At Tell Abraq . . .' 1994). After considerable consultation with a wide range of specialists, D. Martin has confirmed that poliomyelitis is the most likely diagnosis, making this the earliest recorded instance of polio ever confirmed in the archaeological record anywhere in the world.

Mention was made above of contact between late third millennium Magan and the Old Akkadian empire. Not only are these connections attested to in cuneiform sources, but complementary archaeological evidence exists in the form of large, buffware storage jars from Umm al-Nar island (Fig. 7), confirmed by analysis to be Mesopotamian (Mynors 1983), and a seal-impressed jar fragment of Syrian provenance (Amiet 1975, 1985). This material indicates the transport of a liquid, perhaps oil, from Mesopotamia to Umm al-Nar island at this time. Contacts were also maintained in other directions as well. The incised grey and painted black-on-grey wares from numerous Umm al-Nar tombs were manufactured in southern Iran and/or Baluchistan (Blackman et al. 1989) while painted brown-on-buff pottery of Kaftari type from the tombs at Tell Abraq and Shimal/Unar 2 indicate contacts with the Elamite region of southwestern Iran (Potts 2000a: pp 116–117, in press a). Settlements such as Tell Abraq, Hili 8, and Asimah (in Ra's al-Khaimah) have yielded diagnostic examples of black-washed, finely levigated, thick micaceous orange ware which comes from the Indus Valley (Cleuziou 1992: p 97; Potts 1994c: p 617 and Fig. 53.3). These certainly represent fragments of storage jars, suggesting that something was being exported from the Harappan world to the Gulf in bulk. It has recently been posited that a milk-product, perhaps a sort of cheese, was the commodity in question (Gouin 1990: pp 48–49). The presence of diagnostically Harappan etched carnelian beads, as well as thousands of paste micro-beads, and cubical chert weights with identical parallels at all of the major Harappan sites, and small objects of ivory, also implies contact with the Indus Valley in the late third millennium. Finally, a unique ivory comb (Fig. 8) from the tomb at Tell Abraq can be reliably identified on the basis of its particular floral decoration as an import from Bactria (northern Afghanistan/southern Uzbekistan) (Potts 1993d, 2000a: p126).

Excavations at Asimah in the interior of Ra's al-Khaimah have revealed the existence of stone alignments consisting of raised platforms and subterranean graves which, on the basis of their associated finds, also date to the Umm al-Nar period (Vogt 1994a: pp 101ff; Görsdorf and Vogt, in press). These monuments, which have been compared with the triliths and alignments of southern and western Arabia, suggest that a degree of cultural diversity existed in late third millennium south-eastern Arabia which has yet to be adequately investigated.

The Early and Middle Second Millennium (c. 2000–1200 BC)

For many years it was thought that a major discontinuity occurred in the archaeological sequence of the Oman peninsula at the end of the third millennium This was speculatively linked to disruptions in the Indus Valley, where the Mature Harappan period came to an end and the Post-Harappan or Late Harappan era began. In the Indus Valley these changes were long attributed to the Aryan invasion, but this explanation has fallen out of favour with most scholars and remains purely conjectural. The absence of direct references to Magan in Mesopotamian cuneiform sources after the Ur III period (2100–2000 BC) also led scholars to speculate that the alleged Aryan invasion may have caused further disruptions, via a sort of cultural 'ripple effect', in south-eastern Arabia. The settlement record of the region seemed to evaporate, leaving very few sites occupied on anything like a full-time basis, and making it difficult to find the habitations of the many individuals buried in the collective, second millennium tombs of the sort first found at Shimal, but known by the name 'Wadi Suq' after a site in Oman first investigated by Karen Frifelt (Frifelt 1975: pp 377–378). Finally, the notion that the camel (*Camelus dromedarius*) was domesticated sometime in the second millennium gave rise to theories of a reversion to full-time nomadism after the Umm al-Nar period, leading some scholars to view the 'Wadi Suq period' (c. 2000–1300 BC) as a cultural 'dark age' in the region (cf. the discussion in Potts 1993c: pp 427–435).

It remains true today that the absolute number of early second millennium settlements in the UAE and Oman is not great, but on those which have been investigated, such as Tell Abraq, Kalba 4 (Carter 1997), and from the surface indications at a site like Nud Ziba in Ra's al-Khaimah (Kennet and Velde 1995), some population centres continued to be inhabited on a full-time basis and show no signs of a cultural 'decline'. At Tell Abraq, for example, the large fortress-tower of the Umm al-Nar period continued in use down to the middle of the second millennium, with modifications to the outer walls and the construction of new buildings on the interior. Apart from these architectural modifications, there is a major change detectable in the diet of the site's inhabitants, with marine resources (fish and shellfish) becoming more important than they had been in the late third millennium and accounting for about 50 per cent of all dietary requirements (Potts 1995a: p 96). A similar swing from the exploitation of terrestrial fauna (sheep, goat, cattle) to marine resources has also been observed at Shimal as one moves from the earlier to the later second millennium (Grupe and Schutkowski 1989; Von den Driesch 1994; Glover 1998). However, domesticated camel is not attested until the Iron Age and Wadi Suq camel 'nomadism' cannot be invoked as an explanation for the changes in material culture – particularly in the ceramic repertoire – which characterize the period. Moreover, both Tell Abraq and Nud Ziba (Kennet and Velde 1995) provide examples of ceramics which are clearly transitional between Umm al-Nar and classic Wadi Suq types, suggesting that the change from one period to the next was evolutionary rather than revolutionary.

The later Wadi Suq levels at Tell Abraq are paralleled by the occupation of the settlement at Shimal in Ra's al-Khaimah, where an area of habitation at the base of the Hajar Mountains, and within sight of an ancient mangrove lagoon, was located (Vogt and Franke-Vogt 1987; Velde 1990, 1991, 1992). Shimal, and the nearby sites of Ghalilah and Dhayah are, however, better known for the many collective tombs of the Wadi Suq period located there (Vogt 1998). These belong to a number of different formal types. All are constructed of unworked

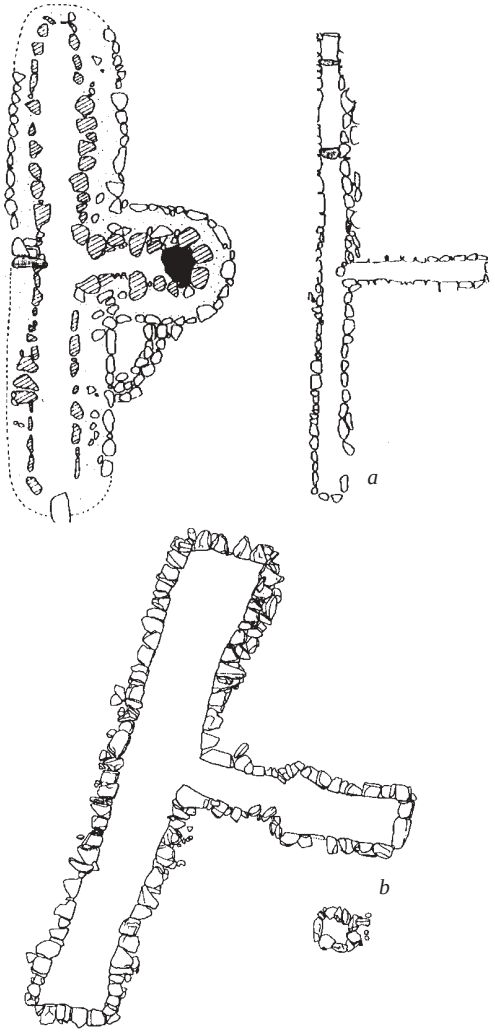
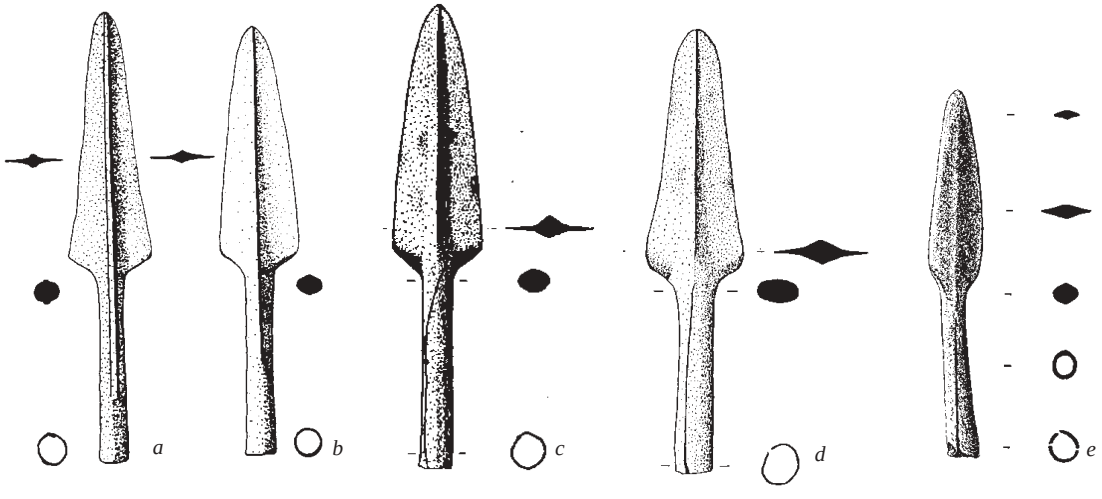


Fig. 9. Plans of the tombs at Dhayah 2 (a) and Bithna (b). After Kästner 1990: Abb. 4, and Corboud 1990: Fig. 4.
Fig. 10. Socketed spearheads of the Wadi Suq period from Dhayah 2 (a-b), and cairn 2 at Jebel Hafit (e). After Kästner 1990: Abb. 6; Vogt and Franke-Vogt 1987: Fig. 21.5-6; and Cleuziou et al. 1979: Pl. 16.1.

boulders and *wadi* pebbles, often of massive size. Unlike their Umm al-Nar counterparts, which were round, the Wadi Suq tombs were generally oval. The simplest 'Shimal' type is an elongated oval enclosure which can be up to 30 m long and roughly 2 m wide (e.g. in the case of Bidiyah 1; see Al Tikriti 1989: 102ff; for Sharm, see Riley and Petrie 1999) with an entrance in one of the long sides. The 'Ghalilah' type is constructed like a broad oval with a central, freestanding wall in the interior. This is used to support the capstones, the ends of which rest on the upper surface of the outer and inner walls. Finally, the 'Khatt' type resembles a Shimal-type tomb with an entrance at one end which is enclosed by an outer wall, thus consisting of two burial spaces, the interior chamber of the 'Shimal'-type structure and a corridor running around its perimeter (Potts 1990b/I: Fig. 28). At Asimah, in the interior of Ra's al-Khaimah, a number of graves with second millennium finds (e.g. As 13) have been excavated which represent a type previously unattested in the region (Vogt 1994a: p 41). These are notable by virtue of their oval shape, marked by a stone wall on the surface, which encloses a subterranean burial chamber, not unlike the original Wadi Suq graves investigated by Frifelt in the 1970s. Many Wadi Suq-period tombs have also recently been excavated at Jebel Buhais, south of Mleiha in the interior of Sharjah, and at Khor Fakkan, on the East Coast of the country (S. Jasim, pers. comm.).



Subterranean, horse-shoe-shaped tombs in the Wadi al-Qawr of southern Ra's al-Khaimah (Phillips 1987) and the Qidfa oasis of Fujairah (unpublished but on display in the Fujairah Museum) must also be dated to the Wadi Suq period. Although previously attributed to the Iron Age (e.g. Potts 1990b/I: p 364), it is now clear from the finds made at Qidfa that the original construction and use of these tombs dates to the second millennium, and that the classic Iron Age material found within them represents the secondary reuse of these structures at a much later date. Subterranean, T-shaped tombs (Fig. 9), such as those excavated at Dhayah (Kästner 1990, 1991) and Bithna (Corboud 1990; Corboud et al. 1996) also date to the Wadi Suq period. Finally, individual inhumation graves dug into the *sabkha* at al-Qusais (Taha 1982–1983), a suburb to the east of Dubai, include many of Wadi Suq date.

The Wadi Suq period is notable for the explosion in metallurgy witnessed at this time. Although often robbed in antiquity, some Wadi Suq tombs, such as the horseshoe-shaped structure at Qidfa, have yielded literally hundreds of weapons and vessels (Weeks 2000a-b). Where the Umm al-Nar period was characterized by daggers and spears, the Wadi Suq period witnessed the introduction of the long sword, the bow and arrow (for incised Wadi Suq arrowheads, see Magee 1998b), and a new, light type of socketed spearhead (Fig. 10). These innovations in weaponry are clearly significant for an understanding of Wadi Suq-period society (Potts 1998a). The long swords of Qidfa, al-Qusais, Qarn Bint Saud Grave 3 (Lombard 1979: Pl. LI.1-4; Vogt 1985: Taf. 122.1-4) and Qattarah (Lombard 1979: Pl. LI.5-6) are double-edged weapons with a raised, central midrib and a concave butt-end marked by rivet holes for the attachment of a separate hilt. The double cutting-edge implies that these were thrusting weapons, and the lack of a well-attached hilt means that they would have been poor devices for slashing. Judging by the light weight of Wadi Suq socketed spearheads, it can be suggested that they were to be used on throwing spears. A comparison with the cuneiform evidence from third millennium Ebla, in Syria, shows that many of the Wadi Suq spearheads are within the weight range of the light throwing spears used there (63.2–79 g.), whereas none of them attain the weight of the heavier points mounted on thrusting lances which were used by foot soldiers at Ebla and weighed approximately 237–474 g. each (Waetzoldt 1990: p 2). The appearance of these weapons, along with hundreds of cast bronze, lanceolate arrowheads with a raised, flattened midrib, suggest an evolution in the technology of warfare during the second millennium unprecedented in the earlier archaeological record of the region.

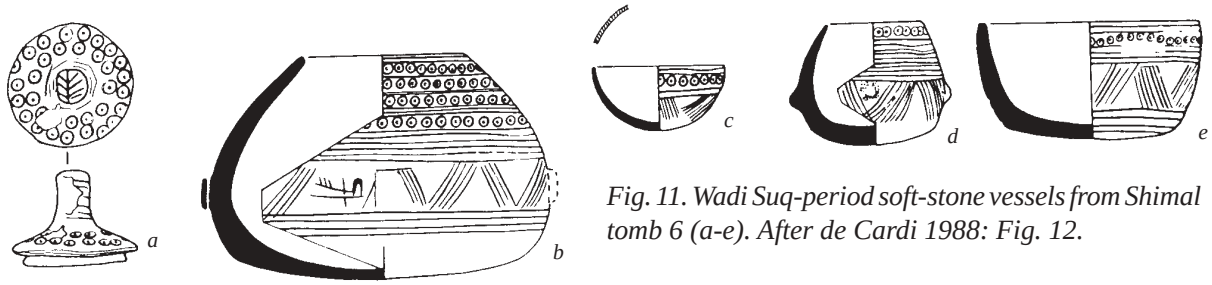


Fig. 11. Wadi Suq-period soft-stone vessels from Shimal tomb 6 (a-e). After de Cardi 1988: Fig. 12.

In the late third millennium an industry arose in the manufacture of soft-stone vessels – generally bowls, beakers and compartmented boxes – decorated with dotted-circles made using a bow drill. During the Wadi Suq period the numbers of soft-stone vessels deposited in tombs increased vastly and new shapes, along with the addition of incised diagonal and horizontal lines in clusters (Fig. 11), allow us to easily separate the later soft-stone vessels from their third millennium forerunners (Häser 1988, 1990a, 1990b).

The continuities visible in settlement at a site like Tell Abraq – in metallurgical technology; in the manufacture of stone vessels, and in the ceramic industry – all point to the obvious conclusion that the Umm al-Nar/Wadi Suq divide, however real archaeologically, was not a complete rupture. We have little evidence of the people themselves from this era, largely because of the poor state of preservation of most of the skeletal remains excavated to date, and the lack of publication of such important complexes as Qidfa and Qattarah. The skeletal material from the tombs at Shimal was highly fragmentary (Wells 1984, 1985; Schutkowski and Herrmann 1987) but studies of the teeth have shown that the population there showed low rates of molar attrition, suggestive of a low 'intake of dried fish, more efficient grain grinding or sieving, or less grain intake' which may reflect a diet heavily dependent on fresh fish and shellfish; low rates of caries, suggesting 'that fermentable carbohydrates [e.g. dates] did not play a large role' in the diet; high rates of calculus formation, associated with other dental pathologies, such as caries-induced abscessing, which 'most probably reflect different dietary constituents, food preparation techniques, or levels of oral hygiene' vis-à-vis other populations in the region; and moderate to severe ante-mortem tooth loss, 'possibly due to inflammation of the periodontium caused by extensive calculus' (Littleton and Frøhlich 1993: pp 440–444).

Some indication of an accumulation of wealth during the Wadi Suq period is provided by an interesting class of gold and electrum plaques in the form of two animals, standing back

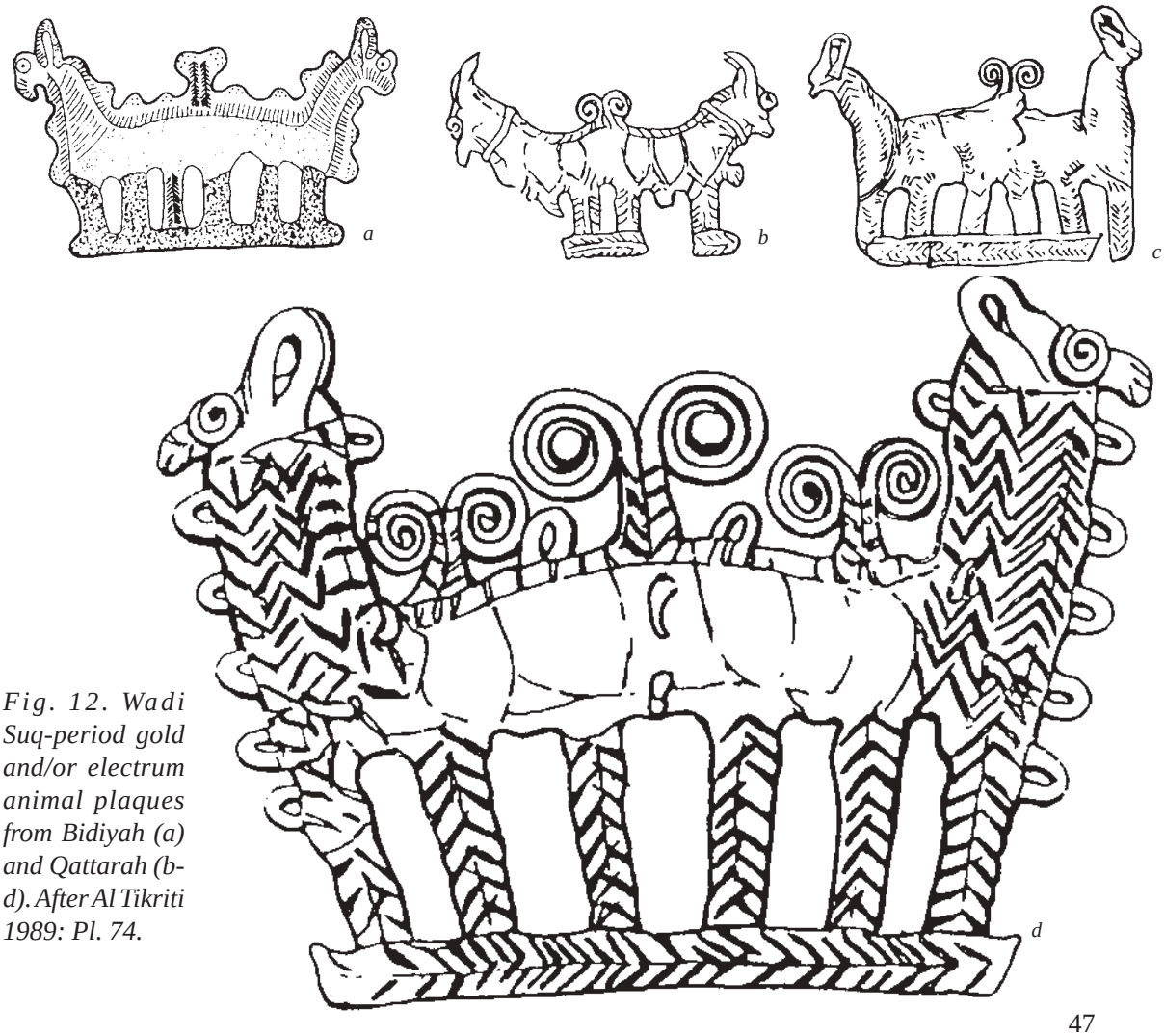


Fig. 12. Wadi Suq-period gold and/or electrum animal plaques from Bidiyah (a) and Qattarah (b-d). After Al Tikriti 1989: Pl. 74.

to back, often with their tails curled up in a spiral. Examples (Fig. 12) are now known from Dhayah (Kästner 1990: Taf. 40, 1991: Fig. 6a), Qattarah (Potts, 1990b/I: Pl. IX), and Bidiyah (Al Tikriti 1989: Pls. 74A, 95B). Some of that wealth may have been accumulated through long-distance trade in copper, a commodity for which Dilmun (modern Bahrain) became famous as a retailer to the southern Mesopotamian market city of Ur in the early second millennium. The discovery at Tell Abraq of over 600 sherds of Barbar red-ridged pottery, now shown to be compositionally identical to the pottery from the settlement at Saar on Bahrain (Grave et al. 1996b) and on the island of Balghelam, Abu Dhabi (Hellyer, pers. comm.), points to the clear existence of contacts in that direction, as does the recovery of Barbar pottery at Kalba on the East Coast (Méry, Phillips and Calvet 1998). Moreover, both Tell Abraq (Potts 1994c) and Shimal (de Cardi 1988: Fig. 11) have Post-Harappan pottery in early second millennium contexts which reflect the ongoing existence of contacts with the Indus Valley at this time.

*Fig. 13. Half of a bivalve (*Marcia*) shell from an Early Iron Age (Iron I) context at Tell Abraq containing atacamite, a cuprous pigment widely used as eye-makeup in antiquity.*

From the Late Second to the Late First Millennium (c. 1200–300 BC)

Two innovations occurred in the late second millennium which were to revolutionize the economies of south-eastern Arabia. The domestication of the camel, attested by the end of the second millennium at Tell Abraq (Stephan 1995), opened up new possibilities for land transport, while the discovery of the principles of using sub-surface water channels for the transportation of water from aquifers to gardens – so-called *falaj* irrigation – made possible the extensive irrigation of gardens and agricultural plots which resulted in a veritable explosion of settlement across the Oman peninsula (Potts 1990b/I: pp 390–392).

In conformity with usage elsewhere in Western Asia, particularly Iran, the period from c. 1200 to 300 BC has traditionally been referred to as the 'Iron Age'. No term could be less appropriate, however, for in south-eastern Arabia iron was not widely used until the following period, except at Muwailah in the interior of Sharjah where iron weaponry has been found which, however, is likely to have been imported from Iran (Magee 1998c). Nevertheless, it is convenient to term this era the Iron Age, particularly when referring to comparable sites and finds from other areas, such as Baluchistan, Iran, and Mesopotamia. Based on the evidence from Tell Abraq, the Iron Age sequence in the UAE can be divided into three sub-periods, labelled Iron I (1200–1000 BC), II (1000–600 BC) and III (600–300 BC) (Magee 1995, Magee 1997). With the exception of a tomb at Asimah (As 100) which contains Iron I material (Vogt 1994a: pp 81ff), all of the evidence for Early Iron Age occupation comes from Shimal, Tell Abraq and al-Hamriyah on

the Gulf coast, and Kalba on the East Coast. Fish and shellfish continued to be important in the diet of the Iron I inhabitants, although domesticated sheep, goat and cattle were kept, and gazelle, oryx, dugong, turtle and cormorant were exploited as well (Stephan 1995; Magee 1995: p 269). Domesticated wheat and barley were cultivated at this time (Willcox and Tengberg 1995; Davis 1998), and the date palm remained as important as ever. The ceramics of the Iron I period show clear signs of continuity with the latest Wadi Suq material (Magee and Carter 1999; Magee et al. 1998), and are in general very coarse, grit-tempered, handmade wares, often in large, open bowl and vat-like shapes (Potts 1990a: pp 103–109). Half of a bivalve shell (*Marcia hiantina*) from an Iron I context at the site was found by x-ray powder diffraction analysis to contain atacamite (Fig. 13), a cuprous pigment widely used in the ancient world as eye make-up (Thomas and Potts 1996). Similar pigment shells have also been found in the late Wadi Suq tomb at Sharm which was re-used during the Iron Age (Masia 2000).

The Iron II period is the 'classic' Iron Age in the UAE and is attested at a number of extensively excavated sites with substantial mudbrick architecture such as Rumeilah, Bint Saud, Hili 2, Hili 14 and Hili 17 in the Al Ain area (Boucharlat and Lombard 1985; Magee et al. 1998); al-Thuqaibah and Umm Safah on the al-Madam plain (Benoist, Cordoba and Mouton 1997); and Muwailah (Magee 1998a, 1998c, 1999a, 1999b; Müller 1999) in the sandy desertic area near the Sharjah International Airport. Many other sites, both graves and settlements, have been located, and it is estimated that at least 150 sites of this period have been documented in the UAE and neighbouring Oman. The explosion in settlement at this time is generally attributed to the invention of *falaj* irrigation technology, and cultivation using the hoe may be inferred from the recovery of a bronze hoe-blade at Rumeilah (Boucharlat and Lombard 1985: Pl. 72.7; Weisgerber 1988: Pl. 161; Potts 1994a).

It is interesting to note that the Iron II period also witnessed the appearance of fortified strongholds, such as Hili 14 in Al Ain (Boucharlat and Lombard 1989), Husn Madhab and Husn Awhala in Fujairah (Hellyer 1993b; Potts et al. 1996; Petrie 1998), Jebel Buhais north of al-Madam (Boucharlat 1992), and Rafaq in the Wadi al-Qawr (Phillips 1997). The purpose of these fortresses, it may be argued, was to safeguard the agricultural settlements associated with them, particularly their precious *aflaj*, and the concentration of power in such centres is an important social and political phenomenon. A cuneiform inscription from Nineveh in Assyria speaks of the existence of at least one 'king' in the Oman peninsula at this time, an individual named Pade, king of Qade, who lived at Is-ki-e (modern Izki in Oman) and sent tribute to the Assyrian emperor Assurbanipal in or around 640 BC (Potts 1990b/I: p 393).

Political and economic control by central bodies may also be implied by the appearance at this time of a tradition of stamp seal manufacture (Lombard 1998), evidenced at a number of sites including Rumeilah (Boucharlat and Lombard 1985: Pl. 66.5–9), Tell Abraq (Potts 1991a: Fig. 135) and Bint Saud (Stevens 1992). Contacts with foreign regions are suggested by a soft-stone pendant from Tell Abraq (Potts 1991a: Figs. 136–137) which shows a figure reminiscent of the Neo-Assyrian and Neo-Babylonian depictions of the *lamashtu* demoness, an evil spirit who spread disease, and it is most probable that such pendants were worn to protect their owners from sickness. The same figure appears in some of the petroglyphs found pecked on rock in the mountains of Fujairah (Ziolkowski 1998; cf. Ceuninck 1998; Haerinck 1998c). Some indication of how such foreign contacts were effected is given by another pendant from Tell Abraq which shows the only Iron Age depiction of a boat in the Oman peninsula

(Potts 1991a: Figs. 142–143). In this case the boat appears to be a square-sterned vessel with a sharp bow and triangular sail (Potts 1995b: p 564). The sail is obviously similar to the Arab lateen sail, otherwise unattested in the region until the Sasanian period and absent in the Mediterranean until c. 900 AD. The Tell Abraq pendant is thus the earliest depiction of a lateen sail yet discovered.

A further link with Assyria (and western Iran) is provided by a class of decorated discs, sometimes described as buttons or buckles, which have been found in a number of Iron Age inhumations in the region, e.g. at Dibba and Qarn Bint Saud (Frifelt 1971: Fig. 11) and Shimal (Vogt and Franke-Vogt 1987: Fig. 18.1-4) and which are strikingly similar to examples known from the Assyrian capital of Nimrud in eighth to seventh century BC. Recently discovered examples in a re-used Wadi Suq tomb at Sharm (Hartnell and Barker 1999) have been shown, upon examination by a scanning electron microscope, to have the internal structure of dentine, corresponding not with a shell but with the lower incisor of a large mammal, such as a camel (Davis 1999a; Susino 1999).

The third and final sub-period of the Iron Age, Iron III, is not very well known, although occupation is attested at half a dozen settlements including Tell Abraq, Shimal, Rumeilah, Hili 17, Hili 2, Nud Ziba and al-Thuqaibah (Magee 1995: p 345), as well as graves in the Wadi al-Qawr (unpubl., in the Ra's al-Khaimah Museum) and Dibba oasis (unpubl., in the Fujairah Museum). The appearance of previously unattested shapes in so-called 'Burnished Maroon Slipped Ware' is significant, for this material, almost certainly imported from Iran, finds close parallels at a number of Iranian sites, including Baba Jan, Godin Tepe, Nad-i Ali, Dahan-i Gulaiman, Tal-i Zohak, and Pasargadae, in contexts dating to between the sixth and fourth centuries BC (Magee 1995: pp 182–183). When combined with the literary and epigraphic record of Achaemenid control over the satrapy of Maka (cf. *Makkan*, **Magan**), the conclusion becomes inescapable that the sudden appearance in the UAE of ceramics paralleled in Achaemenid contexts in Iran is a reflection of the fact that the area was at this time part of the Persian satrapy of Maka (Potts 1990b/I: 394ff; de Blois 1989). In spite of the fact that messengers from Maka, some of whom are referred to as 'Arabs', are attested in the Persepolis Fortification Texts (PF 1545, 2050; PFa 17, 29) in the year 505/4 BC, as are rations for the satrap of Maka (PF 679–680) in the

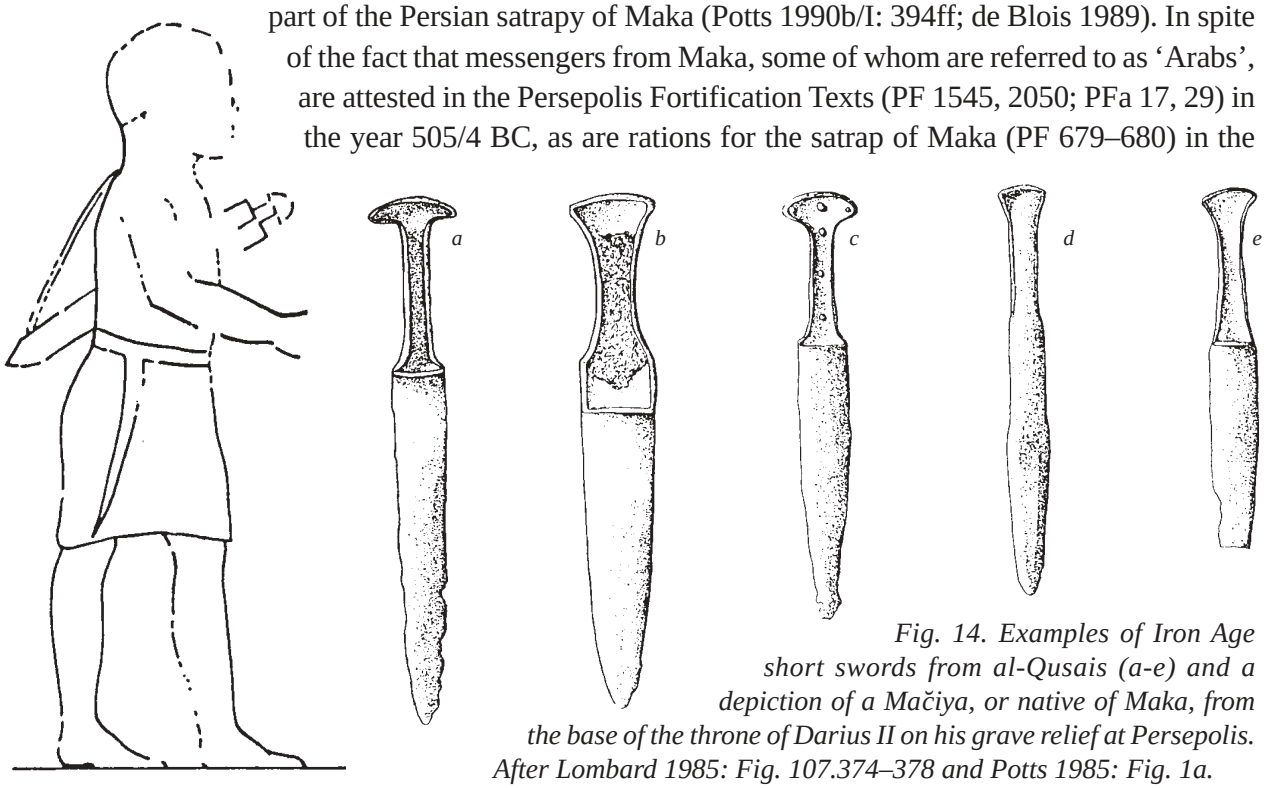


Fig. 14. Examples of Iron Age short swords from al-Qusais (a-e) and a depiction of a Mačiya, or native of Maka, from the base of the throne of Darius II on his grave relief at Persepolis. After Lombard 1985: Fig. 107.374–378 and Potts 1985: Fig. 1a.

years 495/4 and 500/499 BC (Potts 1990b/I: pp 395–397), we still have no idea where the Persian capital of the satrapy may have been located. A contingent from Maka formed part of Xerxes' army at Doriscus in 480 BC (Herodotus, *Hist.* 7.68), and we can get some impression of how they looked from the depictions of Mačiya (inhabitants of Maka) on several Achaemenid monuments, the clearest of which is found on the grave of Darius II at Persepolis (Potts 1985: Fig. 1a). There the Mačiya (Fig. 14) is shown wearing only a short kilt, with a sword slung over his shoulder by a strap. The crescentic pommel of the sword hilt is interesting, and recalls the many Iron Age short swords found at sites in the UAE such as al-Qusais (Fig. 14), Qidfa, Jebel Buhais and Rumeilah (Lombard 1981; Weisgerber 1988).

The Mleiha (Late Pre-Islamic A-B) Period (c. 300–0 BC)

The dissolution of the Persian Empire must have impacted on south-eastern Arabia, for, with the defeat and death of Darius III, Maka was no longer a Persian satrapy. On the other hand, Alexander the Great's conquests never touched the Arabian side of the Gulf and, while he inherited much of what had formerly been the Achaemenid empire, the famous 'last plans' of the Macedonian conqueror, which included an invasion of Arabia, never advanced beyond the stage of initial reconnaissance (Potts, 1990b/II: pp 1–22). Thus, by the third century BC south-eastern Arabia was free of foreign political influence, and it is in this context that the developments of the subsequent centuries must be viewed, for none of Alexander's Seleucid successors was able to establish any sort of Greek dominance in the region either.

How significant these trends were for the local population is difficult to assess. Certainly we can see evidence of continuity as well as change in the local ceramic repertoire, enough to be certain that the basic industry and the people who made and used the wares remained the same. But our evidence is severely restricted and, with the exception of Mleiha, a sprawling settlement on the gravel plain south of Dhaid in the interior of Sharjah which extends over an area several square kilometres in extent (Boucharlat 1987–1988, 1989; Boucharlat and Mouton 1991, 1993; Mouton 1999), we have no other settlements which can be attributed to this time horizon. On the basis of their excavations, French archaeologists working at Mleiha have divided the sequence into four sub-periods, viz. Mleiha I (Iron Age), II (300–150 BC), IIIA (150–0 BC), and IIIB (0–200 AD). For the purposes of this chapter we shall consider Mleiha II and IIIA together, as these correspond to the interval between the end of the Iron Age and the appearance of a different cultural phenomenon best represented further north at al-Dur on the coast of Umm al-Qaiwain (see below).

The occupation of Mleiha represented the continuation of human occupation, in an optimally watered and well-drained area, which had begun in the late prehistoric era (cf. Table 7). The earliest, post-Iron Age settlement probably consisted of *barastis or* '*arish*, palm-frond houses, eminently suited to the hot climate of south-eastern Arabia. Starch residues on groundstone tools (Davis 1999b) and macro-botanical remains of wheat (*Triticum durum/aestivum*), barley (*Hordeum vulgare*) and date (*Phoenix dactylifera*) attest to a successful agricultural regime (Peña-Chocarro and Barrón Lopez 1999). The dead, however, were buried in more substantial structures, mudbrick cists surmounted by a solid tower of brick, capped by crenellated stone ornaments. These structures, which have no antecedents in the region, recall the funerary

towers of Palmyra, Qaryat al-Fau, and the early periods at Petra (Boucharlat and Mouton 1993: p 281; Mouton 1997, 1999; Boucharlat and Mouton 1998).

Both settlement and graves have yielded quantities of ceramics, some of it of obviously local manufacture, carrying on and modifying the norms established during the Iron Age, and some of it foreign. This includes glazed pottery, perhaps produced in south-western Iran or southern Iraq; red and black wares readily identifiable as coming from the north-east Arabian mainland or adjacent islands such as Bahrain or Failaka; and even Greek pottery, imported from the Aegean or Mediterranean. In addition to Greek black-glazed sherds identical to finds from the Athenian Agora, more than half a dozen stamped Rhodian amphora handle fragments (Fig. 15) provide precious clues to the absolute chronology of Mleiha. The named and generally datable Rhodian amphora manufacturers attested at Mleiha include *Iasonos* (early second century BC), *P(ana)mo(u) Ant(ig)onou* (late third/early second century BC), and *Epi Ariotuvos/Theomoaori(os)/ou* (200–175 BC) (Mouton 1992: p 48). Folded-flan coinage from Mleiha, modelled on Athenian 'old style' tetradrachms of fourth century BC date, may represent the earliest indigenous coinage in the region (Haerinck 1998d; Huth 1998, 1999).

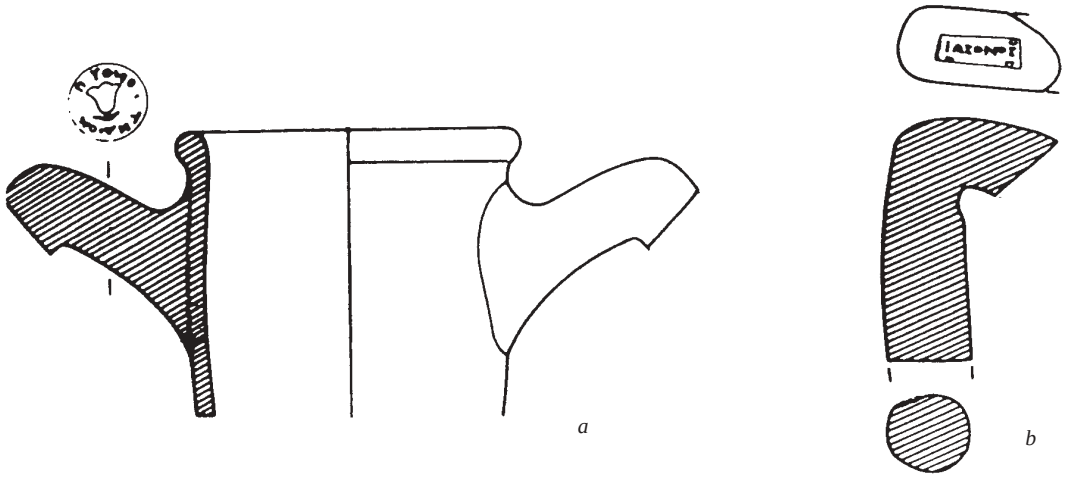


Fig. 15. Stamped Rhodian amphora handles from Mleiha. After Mouton 1992: Fig. 21. 1, 3.

Engraved bronze bowls and beehive-shaped, alabaster vessels from Mleiha II contexts recall examples from South Arabia (Potts 1990b/II: Fig. 18; Boucharlat and Mouton 1993: Fig. 6; Hassell 1997), a fact which is important in connection with the recovery of several items (stone stelae, bronze bowls) inscribed in South Arabian characters (Fig. 16). By themselves, these inscriptions do not necessarily imply contact with South Arabia, for the simple fact that the South Arabian script was also used in north-eastern Arabia to write the so-called Hasaitic inscriptions (Potts 1990b/II: 69–85), many of which begin with the same formula as the Mleiha funerary stele, *nafs/wqbr*, i.e. 'memorial and tomb (of) . . .' (cf. the discussion in Müller 1978: p 150; Potts 1990b/II: p 268 n. 11; Mitchell 1990–92). Moreover, alabaster vessels like those found at Mleiha, although of undoubted South Arabian manufacture, have also been discovered at sites like Thaj in north-eastern Saudi Arabia. Several coins found on the surface of the site are, however, unequivocally South Arabian (Sedov 1995). The question of South Arabian contact and cultural influence is an important one, particularly in view of the legend of the Azd migration out of Yemen and its contribution to the later tribal configuration of Oman.

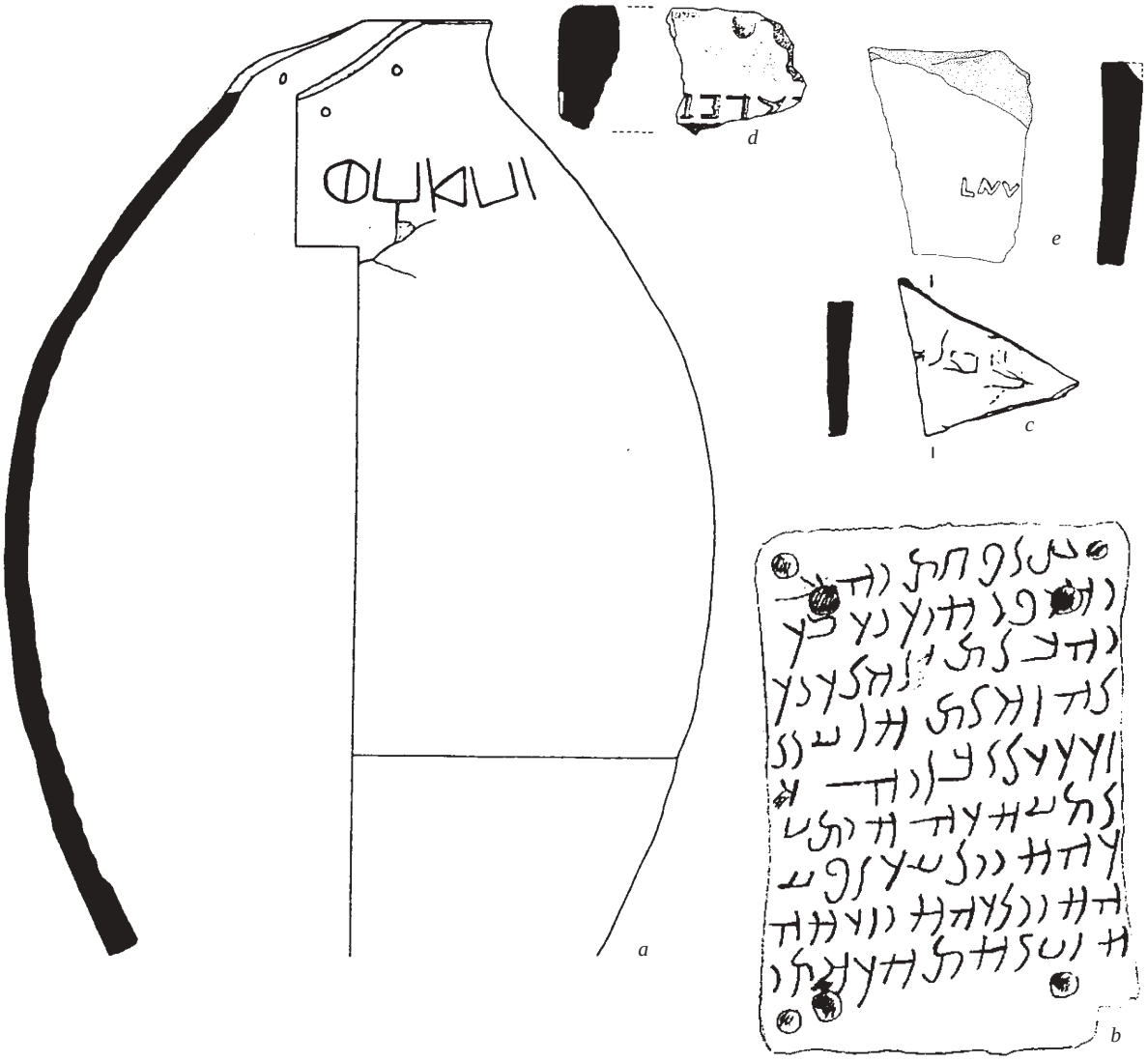


Fig. 16. Examples of inscribed material in South Arabian (a), Aramaic (b-d) and Latin (e) from Mleiha (a-b) and al-Dur (c-e). After Mouton 1992: Fig. 148 and Teixidor 1992: Fig. 2.

One of the cultural innovations which characterizes the late pre-Islamic era is the appearance of iron in large quantities for the first time in the archaeological record of south-eastern Arabia. Alongside utilitarian items such as nails, long swords and arrowheads (Mouton 1990) were used. Whether or not they were manufactured locally is another matter, but in addition to the existence of iron-bearing zones near Jebel Faiyah, Emalah and Buhais, south of Mleiha, the site itself has surface scatters of iron slag (Ploquin and Orzechowski 1994: pp 26ff) suggesting that secondary refining and casting were carried out there. Why iron was previously so rare is a mystery. Certainly the abundance of copper sources in the Hajar Mountains, and the ancient tradition of copper metallurgy may have been a factor contributing to a lack of interest in iron. It has also been suggested that the Seleucid political presence in the Gulf region acted as a catalyst by way of introducing new types of armour and weaponry, made of iron, to peoples previously accustomed to the use only of copper-bronze (Lombard 1989: p 37).

The Al-Dur (Late Pre-Islamic C) Period (c. 0–200 AD)

By the first century AD we have reached a period for which considerably more literary documentation exists, albeit of a difficult nature to use. The Roman writer Pliny the Younger (23/24–79 AD) completed his *Natural History* in 77 AD and, to judge from his account of the peoples and places of south-eastern Arabia (*Nat. Hist.* VI.32. pp 149–152), combined with the second century AD testimony of Cl. Ptolemy's map of Arabia (Fig. 17), the area of the UAE was full of settlements, tribes, and physical features, the names of which he recorded for posterity. Fixing the locations of these, and linking them with archaeological sites, has proven difficult, but it has been argued that 'the town of Omana, which previous writers have made out to be a famous port of Carmania (Pliny, *Nat. Hist.* VI.32. pp 149) [Kerman province in Iran]' may be identified with the large, nearly 4 km sq. settlement of al-Dur in Umm al-Qaiwain (Potts 1988, 1990b/II: pp 306ff; Groom 1994, 1995). The same site is, moreover, mentioned (§ 36) at about the same time in the anonymous *Periplus of the Erythraean Sea*, an important text which documents the maritime trade between Alexandria in Egypt and Barygaza in India. Certainly the archaeological remains of al-Dur leave us in no doubt that the site was the most important coastal settlement so far identified in the lower Gulf during the first centuries AD.

Fig. 17. South-eastern Arabia according to Cl. Ptolemy. After Groom 1994: 200.

Located opposite what is today a sheltered branch of the Umm al-Qaiwain lagoon, al-Dur extends for well over 1 km in a north-east/south-west direction, and is in places up to 1 km wide. Within this vast area is a dispersed collection of private houses, graves, a fort, and a temple, along with extensive sherd scatters without associated standing architecture which probably represents areas of former *'arish* (*barasti*) habitation. Originally investigated in the early 1970s by an Iraqi expedition, al-Dur was the object of a collaborative expedition from four European universities between 1987 and 1994 (Boucharlat et al. 1988, 1989; Haerinck 1991b, 1992, 1993, 1994a, 1994d; Haerinck et al. 1992, 1993; Haerinck 1996b).

Most of the architecture at the site is built of beach rock (Ar. *farush*), a calcareous concretion which forms offshore in shallow tidal areas and can be easily broken into slabs for use as building material. Large houses, some with numerous rooms and round corner towers, have been excavated as well as small, one-room dwellings. The use of alabaster for windowpanes is important and marks the earliest archaeological attestation of alabaster for this purpose in the Arabian Peninsula (Potts 1996). Graves may be either simple subterranean cists for individual inhumations, or large, semi-subterranean collective tombs consisting of a subterranean chamber reached via a stairway from the surface, surmounted by a barrel vault. In general terms the more elaborate graves resemble Parthian tombs at Assur in northern Mesopotamia.

The ceramics from the site are dominated by glazed wares, almost certainly of Parthian manufacture and imported either from southern Mesopotamia or south-western Iran. Fine black-on-orange painted 'Namord' ware (Fig. 18), imported from south-eastern Iran or Baluchistan, indicates contacts across the Straits of Hormuz (Potts 1998b; cf. Wiesehöfer 1998), while rare sherds of Indian Red Polished Ware point to ties with the Indian subcontinent. As the *Periplus* indicates, during the mid-first century AD Omana was the most important port in the lower Gulf, and was twinned with the port of Apologos at the head of the Gulf, a site perhaps located somewhere near modern Basra and one of the main maritime outlets for the kingdom of Characene (Potts 1988, 1997b). While traffic down the Red Sea and across the Indian Ocean provided one means for the Roman acquisition of exotica from India and the east, overland caravan traffic between Palmyra in Syria and the cities of Vologesias, Seleucia and Spasinou Charax in Iraq, followed by seaborne travel down the 'Characene corridor' to Omana and on to India provided an alternative route (Potts 1997b). The latter mechanism may well have been responsible for the diffusion of quantities of Roman glass to al-Dur (Fig. 19), most of which dates to the first century AD (Whitehouse 1998, 2000); at least one western Roman amphora (Papadopoulos 1994); and a handful of Characene coins dating to the reigns of Attambelos II (44/45 AD), Attambelos IV (58/59 AD) and Attambelos VI (104/105 AD) (Potts 1988: pp 141–142). The single Roman coin from al-Dur, an undated PONTIF MAXIM issue of Tiberius (Howgego and Potts 1992) may have reached the site in the same manner.

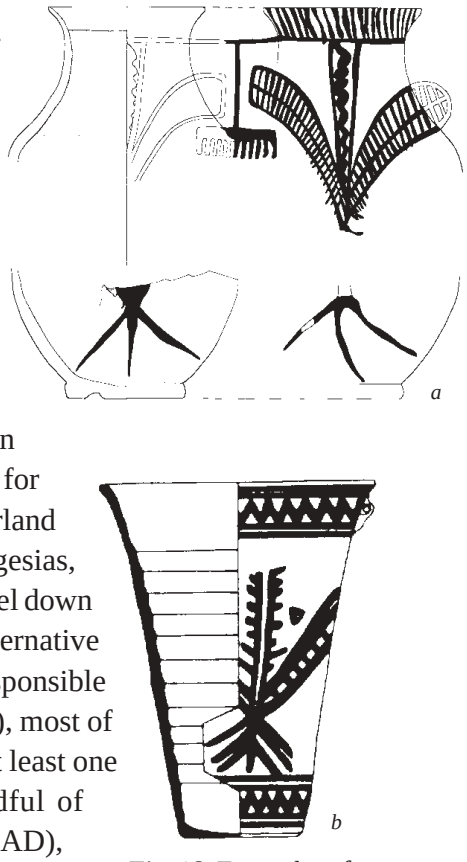


Fig. 18. Examples of early (a) and late (b) Namord ware from al-Dur. After Potts 1998b.

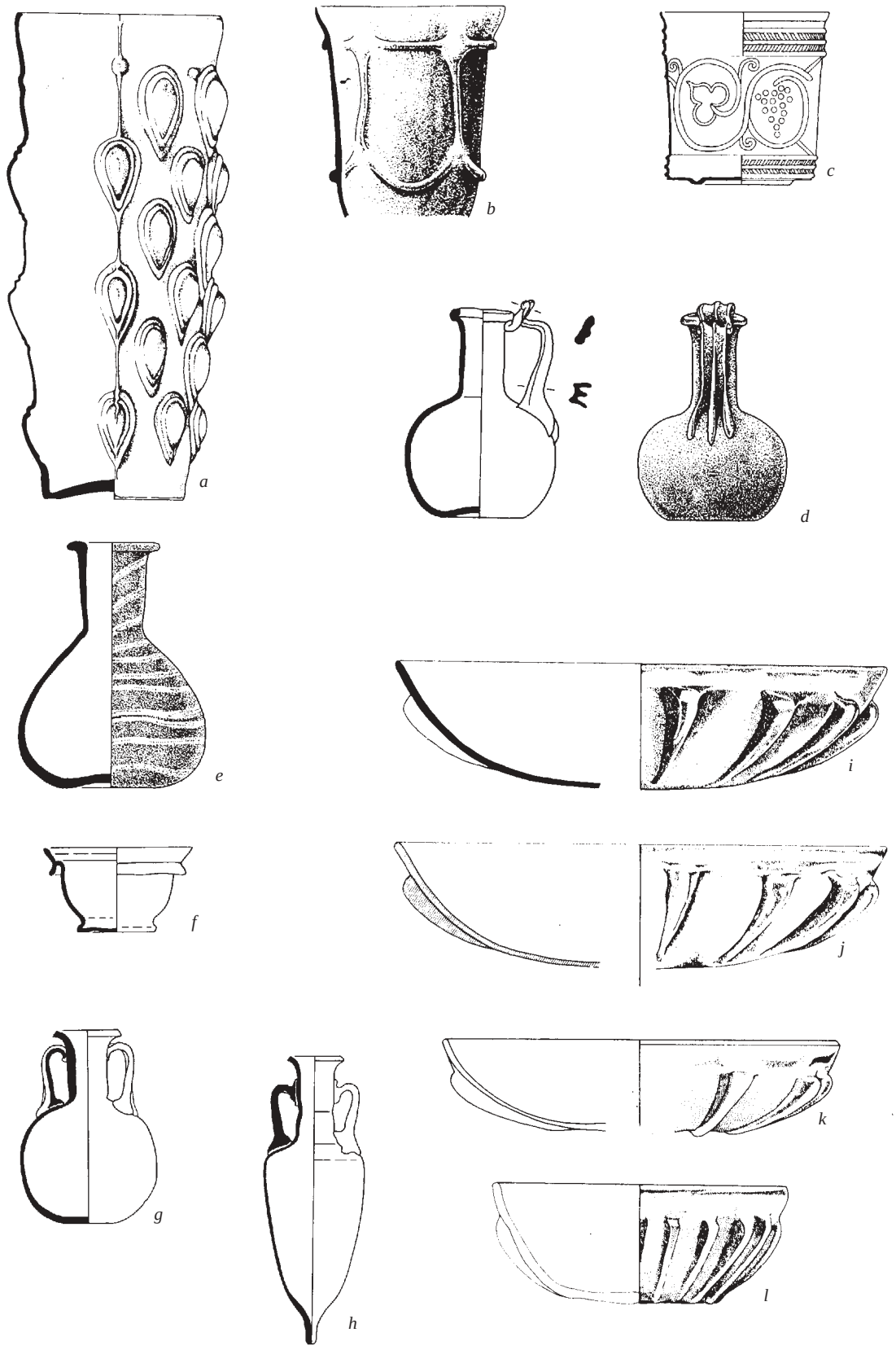


Fig. 19. A selection of Roman glass from al-Dur. After Potts 1997c.

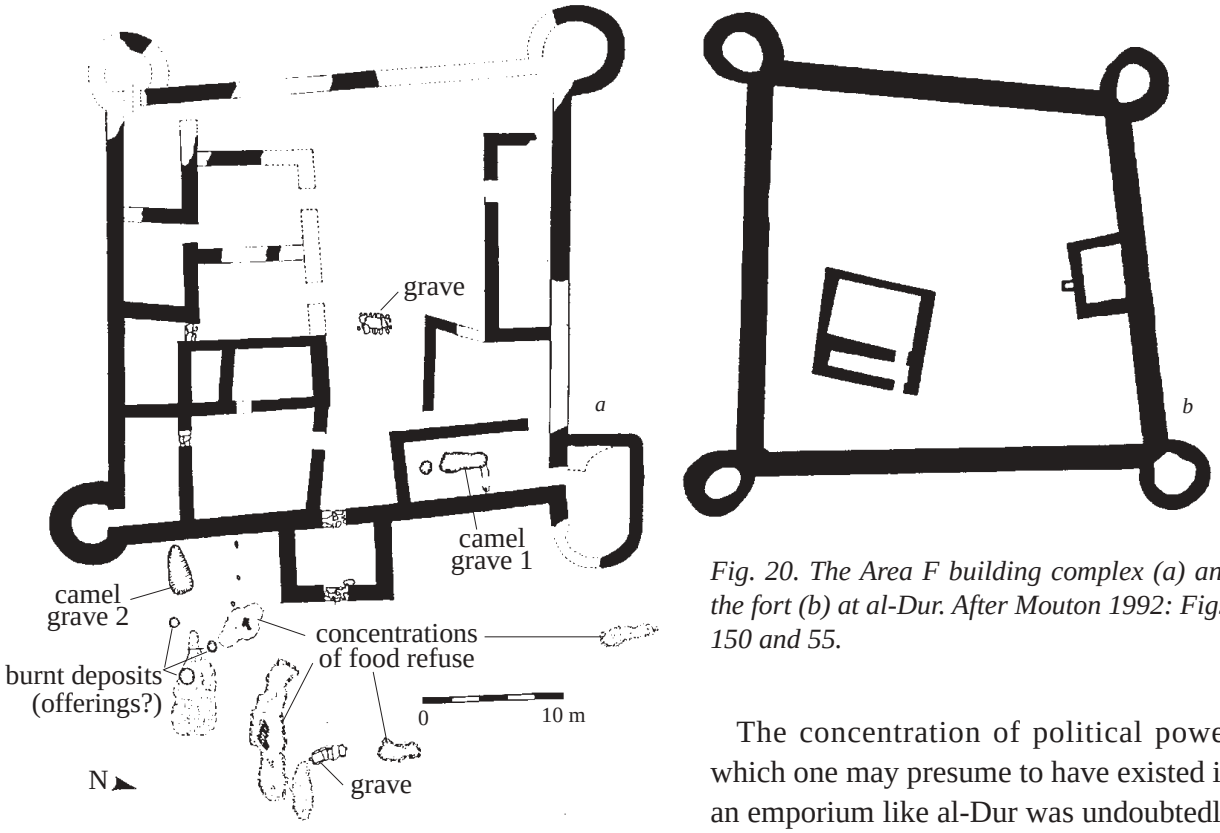


Fig. 20. The Area F building complex (a) and the fort (b) at al-Dur. After Mouton 1992: Figs. 150 and 55.

The concentration of political power which one may presume to have existed in an emporium like al-Dur was undoubtedly centred on the fort (Fig. 20) excavated in 1973 by the Iraqi expedition. Measuring roughly 20 m on a side, and with four circular corner towers each 4 m in diameter, the fort is built of beach rock and shows affinities to contemporary Parthian fortifications in Mesopotamia. South of the fort is an important temple (Haerinck, Vrydaghs and Doutrelepont 1998), excavated by the Belgian expedition, which was a simple, one-room, square structure, roughly 8 m on a side, of beach rock faced with finely worked gypsum plaster imitating ashlar masonry. An incense burner from the temple, inscribed in Aramaic with the name Shams, suggests that this was a shrine dedicated to the pan-Semitic solar deity.

While al-Dur was the prime settlement of this period on the Gulf coast, other minor sites have been identified on the islands of Abu Dhabi as well (Hellyer and King 1999; King and

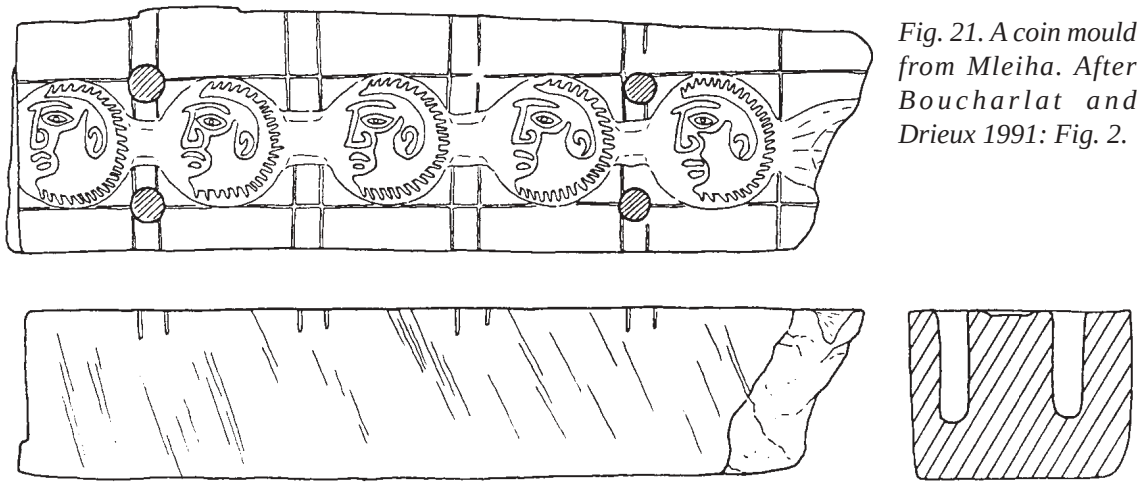


Fig. 21. A coin mould from Mleiha. After Boucharlat and Drieux 1991: Fig. 2.

Tonghini 1998). In the interior, Mleiha was certainly the leading centre, apart from which only a few graves have been identified (de Cardi 1996; Petrie 2000). Mleiha has produced remarkable evidence dating to this period of a cemetery in which both horses and camels were buried. In addition, one of the most important discoveries made in recent excavations at the site was a square fort with square corner towers in Area CW, the main outer wall of which was 55 m long, attributable to Mleiha IIIB (0–200 AD) (Benoist et al. 1994: p 12). Associated with the fort, moreover, was a stone mould (Fig. 21) for the production of coins (Boucharlat and Drieux 1991), and as the right to strike coinage was generally a royal prerogative in the ancient world, it is likely that the Mleiha fort represents the power centre of the polity centred on the site. The coins minted at Mleiha – hundreds of which have been discovered at both al-Dur and Mleiha (Potts 1991b, 1994d; Haerinck 1994c; Grave et al. 1996a; Haerinck 1996a, 1998a, 1998b, 1998e, 1999) – were modelled on the coinage of Alexander. They show a debased head of Heracles wearing the pelt of the Nemean lion on the obverse, and a seated figure, based on that of Zeus, on the reverse. Whereas the original Greek models had the name ALEXANDER clearly written in Greek on the reverse, the Mleiha/al-Dur coins (Figs. 22–23) bear a legend in angular, lapidary-style Aramaic which can be read as 'Abi'el, son/daughter of *bgln/tmyln/tlmyl/tym*..' (Potts 1994d: p 43). However the patronymic should be read (Maraqten 1996), the name Abi'el is always clear, and as this must be the monarch who originally minted coins of this type, we can safely conclude that Abi'el was an important ruler in the wider region during the late pre-Islamic era.

The situation is complicated, however, by the fact that variant, prototypical issues with the name Abi'el have been found in a hoard on Bahrain datable to the second century BC. Thus, the later Mleiha issues from the first century AD may have repeated the name of an important political figure in the region long after that individual had died, just as the many Asiatic issues which were based on those of Alexander repeated the name of the Macedonian king over and over again, even centuries after his lifetime. Until this issue can be resolved it is wisest not to assume that the fort at Mleiha represents the stronghold of the eponymous Abi'el. That Aramaic was the language of the populations of Mleiha and al-Dur at this time is, however, confirmed not only by its use on coinage, but also by the discovery of other inscribed objects, such as a unique bronze plaque from Mleiha (Teixidor 1992) and several short lapidary inscriptions at al-Dur (Haerinck et al. 1991: p 36).

Fig. 22. A silver tetradrachm of Abi'el (Class S2) from Mleiha; weight 14.68 g., diameter 2.70 cm. After Potts 1994d: 45, no. 183.

Fig. 23. A silver tetradrachm of Abi'el (Class XLVI) from Mleiha; weight 16.02 g., diameter 2.20 cm. After Potts 1994d: 66, no. 338.

The End of the Pre-Islamic Era (c. 240–635 AD)

Although the extent of the political influence of the Parthians in south-eastern Arabia has long been debated, there is little doubt that their Sasanian successors swiftly imposed their will on the inhabitants of the region shortly after coming to power. According to the *Karnamak-i Artachsher-i Papakan*, the 'Book of Deeds' recounting the exploits of Ardashir (224–240), founder of the Sasanian state, *mčvnyg'n* or natives of Mazun (the name given to Maka in Middle Iranian, Syriac, Armenian and Arabic sources; see de Blois 1989) fought against Ardashir early in his career. Later Arab sources, such as al-Dinawari (c. 895) and the anonymous *Nihayatu'l-irab fi ahbari'l-furs wa'l-'arab* (c. 1000–1050), contend that Ardashir campaigned in Oman. Certainly the great Ka'aba of Zoroaster inscription at Naqsh-i Rustam near Persepolis lists MZWN, i.e. Mazun, as the twenty-seventh land in the empire of Shapur I (240–270 AD), Ardashir's son (Gignoux 1971: p 92–93; Potts 1990b/II: p 329; Huyse 1999/I;p 24).

Archaeologically, however, there is little concrete evidence of a Sasanian presence in the UAE. The few coins recovered on the Gulf coast include a pair of badly preserved bronzes of Ardashir and Shapur II (309–379) from Ghallah, an island in the lagoon of Umm al-Qaiwain, as well as a silver coin of the latter king from Tell Abraq (Potts and Cribb 1995: pp 129–130). In Fujairah, a small hoard of 18 silver coins was discovered which included issues of two late Sasanian monarchs, Hormizd IV (579–590) and Khusrau II (590–628) (Hellyer 1995).

The absence of Sasanian material should not be interpreted as a sign that there was no settlement in the region at this time. The latest occupation at Tell Abraq can be dated to this period by the Shapur II coin found in 1993 in a context close to the surface (Potts and Cribb 1995: p 130). Area F at al-Dur, a large, multi-roomed house with corner towers, represents the most extensively excavated complex of this date found so far (Lecomte 1993). It is well-dated by the numerous examples of Sasanian glass found there, all of which find close parallels at sites in Mesopotamia. Further up the coast, at Jazirat al-Hulayla, late pre-Islamic ceramics and structures have also been found (Kennet 1994: Figs. 9–11), while excavations at the substantial mound of Kush, near Shimal, demonstrate that settlements with occupation of Sasanian date do exist in the region (Kennet 1997, 1998). In the interior, several intrusive burials with iron weaponry (spear, sword, pike) dug into the prehistoric tombs at Jebel al-Emalah can be attributed to the very end of the pre-Islamic period. A fragmentary individual buried with an iron sword in Tomb I has produced a corrected radiocarbon date of 455–583 AD, while a fully articulated individual buried with an iron-tipped spear from Tomb III has been dated to 513–624 AD (Potts 1997c).

A third burial at Jebel al-Emalah with iron accoutrements was that of a camel in its own, oval grave ringed by stones. Camel burials are a phenomenon well-attested in the late pre-Islamic era throughout the Arabian Peninsula (Vogt 1994b), and elsewhere in the UAE they are known at both al-Dur (Lecomte 1993) and Mleiha (Mashkour 1997; Jasim 1999; Uerpmann 1999). Yet it would be wrong to suggest that the religious climate of the era was dominated either by Arab paganism (viz. camel burial) or Zoroastrianism (viz. Sasanian influence). Nestorian Christianity was a decidedly important component of the religious milieu at this time as well.

In 424 Yohannon, bishop of Mazun, attended an important synod at Markabta de Tayyae in Iraq, where the Nestorian church proclaimed its independence from Antioch (Potts 1990b/II: p 333). This is the first concrete evidence of Nestorian Christianity in south-eastern Arabia, although the *Vita Ionae*, an account of the life of a monk named Jonah who lived in the time

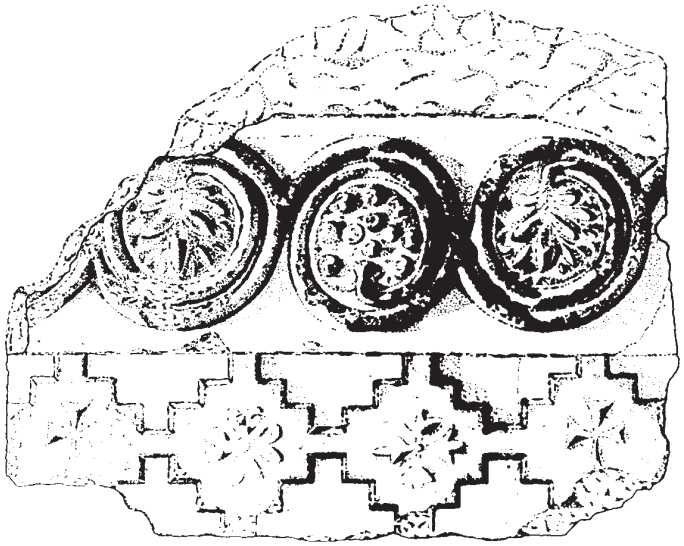


Fig. 24. A stucco fragment from a Nestorian building on Sir Bani Yas. After King and Hellyer 1994: 6.

of the *catholicus* Barb'ashmin (343–346), says that Jonah built a monastery 'on the borders of the black island', a locale which some Nestorian scholars have sought amongst the islands between Qatar and Oman. In this connection it is obvious to consider the islands off the coast of Abu Dhabi as a likely site for Jonah's monastery. The recent discovery on the island of Sir Bani Yas (Hellyer 1993a; King and Hellyer 1994; King 1997) of a monastery and/or church, complete with carved stucco ornamentation including several crosses (Fig. 24), is of enormous interest in this respect, as is the identification of another probable monastery on the island of Marawah (P. Hellyer, pers. comm.).

The literary testimony of Nestorian Christianity in the region does not resume until 544, perhaps due to a temporary loss of control over the area by the Sasanians and their Lakhmid vassals at the hands of the Kinda of central Arabia (Potts 1990b/II: pp 334–335). Be that as it may, in 544 David, bishop of Mazun, attended the Nestorian synod of Mar Aba I, and in 576 Samuel attended the synod of Mar Ezechiel. Mazun is included in an important Armenian list of the provinces of the Sasanian empire compiled late in the Sasanian period, and it is certain that the region was under Sasanian control at the time of the Islamic conversion.

Two major towns of the period are mentioned in literary sources, Tuwwam and Dibba. Both towns were taxed by the Al Julanda, clients of the Sasanians who reported to the Persian *marzban* (military governor) at al-Rustaq in Oman (Potts 1990b/II: p 337). Tuwwam, although identifiable with the region of Al Ain/Buraimi (Wilkinson 1964: p 344), is invisible archaeologically, for no late pre-Islamic remains contemporary with the period of Sasanian governance have been unearthed there. Dibba, of course, is still the name of a major port and oasis settlement on the East Coast of the UAE which is today divided between Oman, Fujairah and Sharjah. Although the archaeology of Dibba in the late pre-Islamic era is known only from chance finds, the literary record is more ample.

In his *al-Muhabbar*, Ibn Habib called Dibba 'one of the two ports of the Arabs; merchants from Sind, India, China, people of the East and West came to it' (Shoufani 1972: 156). At this time Dibba paid a tithe to Al Julanda b. Al Mustakbir on the occasion of a fair held each year for five nights beginning on the first day of Rajab. The commercial importance of Dibba at this time explains why Jayfar, one of the Al Julanda addressed by the Prophet in a letter carried by Abu Zaid and 'Amr b. Al-'As in the year 630 (AH 8), sent a messenger to Dibba exhorting its inhabitants to convert to Islam (Ross 1874: pp 118–119). Just a few years later, however, Dibba became the base of Laqit b. Malik, the leader of the *al-Riddah* or apostasizing movement, and the crushing of that movement by the armies of the Caliph Abu Bakr (Shoufani 1972: p 8) created one of the largest and most important historical sites in the UAE, a vast cemetery said to contain upwards of 10,000 slain rebels (Potts 1990b/II: p 345) on the outskirts of Dibba.

Christianity in Mazun certainly survived some decades after the Muslim conversion, for Stephen, bishop of Mazun, attended a synod in Mesopotamia in 676. The apostasy of the Christian community, however, was rife in this period, a fact amply documented by a series of letters sent by the Nestorian catholicos Isho'yahb III to Simeon of Rev-Ardashir in Iran, complaining about the conversions of 'your people in Mazun' (Potts 1990b/II: p 346). The subsequent absence of any more bishops from Mazun at the synods of the Nestorian church is an indication that Christianity probably did not survive in south-eastern Arabia much beyond the seventh century.

Conclusion

It is scarcely possible to draw a simple conclusion from the rich archaeological and historical record of the pre-Islamic past of the UAE, but several observations suggest themselves nonetheless. Quite clearly, archaeological research during the past decade has proceeded at a pace scarcely imaginable even 20 years ago, and there has been a veritable explosion of knowledge as the bibliography appended here attests. Archaeological museums have appeared all over the country which display the impressive finds of numerous excavations. The modern inhabitants of the UAE have an archaeological and historical past which should make them the envy of many of their neighbours, and dispel once and for all the notion that this region was peripheral in antiquity. Had it been peripheral, why would a series of Old Akkadian, Achaemenid, or Sasanian emperors have expended so much energy on campaigning in the area? The lack of a local written record comparable to the cuneiform archives of Mesopotamia or the hieroglyphs of Egypt must never blind us to the fact that, in antiquity, the region of the UAE was a strategic, well-resourced, important part of the cultural mosaic of ancient Western Asia. With the continued goodwill of the rulers of the seven emirates, it is to be hoped that archaeological research in the UAE continues to make advances at the pace set by a committed body of scholars from a variety of nations during the past 20 years. Let us hope, also, that their ranks are swelled by the addition of more indigenous scholars from the UAE itself.

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Abbreviations

AAE	*Arabian Archaeology & Epigraphy*
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AUAE	*Archaeology in the United Arab Emirates*
PSAS	*Proceedings of the Seminar for Arabian Studies*

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The Coming of Islam and the Islamic Period in the UAE

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Introduction

Although the Islamic archaeology of the UAE has only been investigated in a sustained manner in very recent decades, the amount of information that it provides has been so great that, for the pre-modern period, it is now at least as important a source for the country's past as the rather sporadic and limited literary evidence. As a result of archaeological survey and excavation, form has been given to periods in the UAE's history that were hitherto invisible. The archaeological record now shows the nature of the UAE's settlement patterns and uses of the landscape, its social and economic structure, and an architectural tradition, little of which is apparent in the written sources. For the Islamic period, as for earlier times, archaeology is in fact often the only means to retrieve the past of the UAE and new fieldwork on sites related to the last 2000 years has brought the country into the historical framework of the Near East as a whole.

The Landscape, the Environment and the Islamic Geographers

The landscape has dictated the nature of habitation in the UAE just as much in the Islamic period as it did in more ancient times. Beginning in the far west, the coast of Abu Dhabi and the interior is a harsh area with a band of salt flats (*sabkha*) between the sea and the gravel plains that precede the deep sands of the Empty Quarter desert. The coast is extremely inhospitable and unattractive for any form of settlement, consisting as it does largely of *sabkha*: after rain, this *sabkha* is virtually impassable for travellers. Furthermore, the sea just offshore is often so shallow and befouled by shoals that it is difficult for boats under sail to navigate. As a result, for both the pre-Islamic and the Islamic period, evidence of settlement on the coast of the mainland is rare west of Abu Dhabi up to the Qatar peninsula. By contrast, east of Abu Dhabi, at Dubai and Sharjah and in the northern emirates, ports are more frequent, although the shoreline is still encumbered by *sabkha* in many places.

There is a growing body of archaeological information to show that activity on the offshore islands, whether seasonal or permanent, has extended over a very long period and down to pre-modern times. On many of the islands there are numerous small stone-lined hearths for

the baking of fish: hitherto, these hearths have been associated with the later Islamic period and, indeed, older UAE inhabitants still know how to use them. However, C14 dating of ash deposits show that hearths on the island of Marawah, west of Abu Dhabi, belong to a series of dates ranging from *ca* 2281–1884 BC to *ca* 130–387 AD. Hearths of the same character from the island of Balghelam to the east of Abu Dhabi city provide a similarly wide date range, from *ca* 2269–1925 BC down to *ca* 764–395 BC, showing the longevity of this hearth cooking tradition. The coast of the UAE is, after all, the land of the *Ichthyophagi* of the Classical authors and, given the quality and quantity of the fish and shellfish in the waters of the Gulf, there is every reason for this hearth baking technique to have continued unchanged through pre-Islamic and Islamic times. Related to this economy are fish traps of which large stone-built examples constructed across bays are encountered on the islands of Ghagha' and Yasat al-ᶜUlya, but these may be far older than the Islamic period in origin. The technology of reed fish traps, still encountered all along the coast, is also doubtless of great antiquity (Serjeant 1968: pp 486–514).

Behind the coast, the hinterland of Abu Dhabi emirate is a sand desert, with mountainous aeolian sand dunes rising to more than 300 m above the underlying palaeofloor gravels that preceded the arrival of the sands. Camel herding in this desert area has been central to the life of the nomadic pastoralist population throughout the Islamic period as well as in very much earlier times. The ancient river system of the Sabkha Matti in the west of the UAE has long since ceased to flow out of the Empty Quarter sands: however, the inland oases at Liwa and at Al Ain have reliable water sources and they supported date plantations whose products have provided a major element in the traditional local diet and economy since ancient times. Excavations at Dalma off the Abu Dhabi coast by ADIAS[1] have shown the presence of date-stones, presumed to reflect dietary use, which C14 analysis has dated to *ca* 5280–4950 BC. This constitutes the earliest evidence of the use of the date in Arabia. There is probably a very ancient tradition of exporting dates from the oases of the UAE to the coast, while dried fish and salt-packed fresh fish seem to have come in the opposite direction. Members of some tribes in living memory would migrate seasonally between the desert oases and the islands, herding camels and cultivating dates in the interior and fishing and pearling on the islands. It seems likely that such a pattern reflects practice over a very long period of time.

In the east and north of the UAE, the sands and gravel plains give way to the high rocky mountains of Jebel Hajar, part of the range that runs from Jebel Akhdar in the Sultanate of Oman through to Ru'us al-Jibal and Ra's Musandam, the lofty promontory that overlooks the Straits of Hormuz. Rainfall is heavier here and this is reflected in the far greater fertility that characterizes Ra's al-Khaimah, Fujairah and the parts of the emirates of Sharjah and Dubai that lie in this region. The terraced hillsides and mountain-top farmsteads are based on cultivation of grain and other crops, while sweet water retained in the gravels of the foothills allows farming on quite a large scale. Livestock rearing is based on sheep, goats and cattle, rather than the camel-based economy of the desert areas to the west.

Although Dibba, Julfar and Tuwwam (Al Ain/Al Buraimi) are mentioned in the Arabic sources from the arrival of Islam in the area, it is not until the ninth century AD that additional places names in the modern UAE begin to be recorded. Ibn Khurradadhbih (Ibn Khurradadhbih 1967: p 111), a former official in the Abbasid Caliphate's postal service, writing in *ca* 885–6, provides a series of itineraries that reflect the main routes through the Islamic world in his

day. He describes a coastal route from the Oman Peninsula[2] to Mecca, mentioning Farak, ᶜAwkalan, Habat (?), and then al-Shihr, a port of the south coast of Yemen. It is unclear where the first three places were located although it seems that they should be sought along the Batinah coast of Fujairah and the Sultanate of Oman or in Dhofar and Mahra along the south coast of Arabia.

Elsewhere, Ibn Khurradadhbih (Ibn Khurradadhbih 1967: p 113) mentions the towns of Bahrain. Bahrain to the medieval Arab geographers meant not only the island that now bears the name but the mainland opposite and its hinterland. Within this broad definition of Bahrain, Ibn Khurradadhbih refers to al-Khatt, al-Qatif, al-Aara and Hajar, all apparently in Saudi Arabia today. The next place name he records is al-Faruq, and then Baynuna. The location of al-Faruq is unclear but today Baynuna (Baynunah) is an area in the Western Region of Abu Dhabi emirate. Mustawfi, writing before 740/1340, also mentions Baynuna in discussing Bahrain and other places in the Gulf (Mustawfî 1919: pp 135–6).

Ibn Khurradadhbih cites a verse by the eighth century poet of the Umayyad period, al-Nabigha, who refers to the wild cows of Baynuna. Given the nature of the desert landscape of the modern Baynuna, it is hard to imagine cows there and it may be that al-Nabigha refers to the indigenous Arabian oryx that used to roam wild in the Empty Quarter until they were hunted to near extinction in the twentieth century. Alternatively, al-Nabigha's use of the term Baynuna may be loose and may refer to a far broader area of the modern UAE. It is worth recalling that, in the more fertile northern emirates, there are still humped back cows that are indigenous to the country. Furthermore, there is a tradition in Fujairah emirate of pitching bulls against each other (Hellyer 1990: pp 50–54). Although this custom has been associated with the Portuguese presence in the UAE, local sources suggest that bull fighting is far more ancient. In this respect, it is worth recalling that the bull is a common motif in the pre-Islamic religious art of southern Arabia. Thus, while identifying the Baynuna cows with the oryx may be a reasonable interpretation of al-Nabigha's verse, there is a broad south-east and southern Arabian context into which his reference to wild cows could fit.

Al-Maqdisi in the tenth century AD describes the citadels (*qasaba*) of Oman, which included Suhar, Nizwa, al-Sirr, Danak, Dibba, Salut or Salub, Julfar, Samad, and Lasya Milh (al-Maqdisi 1967: pp 70–71). Elsewhere, he mentions Khasab in Musandam. He then mentions other eastern and central Arabian towns – al-Ahsa' (al-Hasa'), Sabun, al-Zarqa', al-Uwal, al-ᶜUqayr, and al-Yamama (today, apparently, all in Saudi Arabia or Bahrain). His itinerary generally runs from east to west and a number of the places he describes can still be recognized on a modern map: Suhar and Nizwa are now in the Sultanate of Oman; Dibba is in Fujairah and Sharjah territory, and Julfar is in Ra's al-Khaimah. There follows Lasya Milh and Samad, and the next place al-Maqdisi mentions, al-Ahsa', which is now in Saudi Arabia. Samad and Lasya Milh seem to be in the UAE but cannot be readily identified.

Abu'l-Faraj Qudama (Qudama 1967: pp 151–2), writing between 932 and 948 AD, gives an itinerary from Oman to al-Basra, *via* Qatar and al-ᶜUqair, recording a place between them called al-Sabkha ('The Salt-flats'). It was apparently in the UAE. al-Sabkha was also known to al-Idrisi (al-Idrisi 1836/I: p 157; 1972/II: p 162), writing in 1154 in Sicily for the Norman king, Roger II. He refers to an itinerary from Suhar, to Damar, Muscat, al-Jabal and Julfar. Al-Jabal must refer to the Jebel Hajar mountain range. After Julfar, al-Idrisi says that the

traveller sailed to Bahrain *via* the port of (al-) Sabkha. Al-Sabkha remains unidentified but it could be identical with al-Maqdisi's Lasya Milh, given the suggestion of salt in the latter's name and the meaning of al-Sabkha as 'salt flat'. However, the word *sabkha* itself is vague and generalized and thus could be anywhere on the salt flats (*sabkha*) that run along the UAE coast westwards from Umm al-Qaiwain to the far west of Abu Dhabi emirate and beyond to Qatar. Both Lasya Milh and Sabkha are located west of Julfar in al-Idrisi's itinerary, but whether they were predecessors of Umm al-Qaiwain, Ajman, Sharjah, Dubai or Abu Dhabi seems impossible to determine at present. It has been suggested that Sharjah should be associated with Ptolemy's Sarkoepolis and Lasya Milh and/or al-Sabkha. An alternative could be al-Jumayra (Jumeirah) near Dubai which was apparently still settled in the ninth century AD, and which would be a persuasive Early Islamic candidate for a settlement associated with the harbour of al-Sabkha or Lasya Milh (Potts 1992/II: pp 319–320).

While al-Idrisi is quite specific in his reports about the UAE, he should be treated with some caution as his work, produced in Palermo, was based on the reports of others, although these reports seem to be based on direct observation. To be understood alongside his geographical text is his famous map which appears in various versions of his work and which is one of the most significant documents for Arabian geography since the second century AD map of Claudius Ptolemy. Al-Idrisi's mapping and his account of the coast of the UAE is not superseded until the Portuguese mapping of the sixteenth and seventeenth centuries.

Al-Idrisi knew the western waters of the UAE as the Sea of Qatar and described the islands there briefly but accurately as desert islands that were frequented only by sea birds and land birds. The guano which these birds shed was collected and transported to al-Basra in Iraq where it fetched a high price for use on the farms and gardens to manure vines and dates at al-Basra itself and elsewhere. Al-Idrisi's report is remarkable in its accuracy. The colonies of seabirds on the offshore islands of western Abu Dhabi are sometimes vast, and islands favoured by them are indeed thick with their guano. The island of Kardal, off Ghagha' in western Abu Dhabi, for example, lies deep in the guano deposits of the thousands of cormorants which inhabit it. There are many similar nesting sites. Guano was still being collected by boats for sale as fertilizer as recently as 40 years ago (Khalfan al-Rumaithi, Bab Field, ADCO, 27.12.1998, pers. comm).

Al-Idrisi also mentions the pearl beds of the Gulf although he associates them with Suhar, Damar, Muscat, al-Jabal (*i.e.*, Musandam) and Julfar. However, he says nothing of the far more extensive group of pearl-beds that lie in the western waters of the UAE coast. This may be because the informants of al-Idrisi were more aware of the harbours whose fleets fished for pearls than the location of the pearl-beds themselves.

Yaqut, writing in *ca* 1225, recorded an itinerary which ran from al-Bahrayn in al-Khatt, to al-Qatif, al-Ara, Hajar, Baynuna, al-Zara, Jawatha, al-Sabur and al-Ghaba (Yaqut 1866–69/I: p 507). This itinerary seems confused, displacing Baynuna from western Abu Dhabi off to the north between Hajar and Jawatha, both in al-Hasa' in Saudi Arabia. Elsewhere, Yaqut refers to Baynuna as a place between Oman and al-Bahrayn, which is very vague (Yaqut 1866–69/I: p 802). He mentions that Tuwwam (Al Ain) had its own citadel (*qasaba)* and he states that the principal citadel of Oman was Suhar. Yaqut also refers to Julfar which he calls Jullafar or Jurrafar, describing it as a town in Oman which had many sheep and which produced cheese and *samn* (ghee) (Yaqut 1866–69/II: p 104; II: p 63).

Gasparo Balbi, the state jeweller of Venice, made a visit in *ca* 1580 to the territory of the UAE to investigate the pearling industry. He is the first writer to record place names between al-Qatif and Oman that are still in use today (Slot, 1993, 36 ff.). Like al-Idrisi, he knows the waters off the Abu Dhabi coast as the Sea of Qatar and mentions the following places now in UAE territory: Daas (Das), Emegorcenon (Qarnein), Anzevi (Arzanah), Zerecho (Zirkuh), Delmephialmas (Dalma), Sirbeniast (Sir Bani Yas), Aldane (Dhanna), Cherizan (identified as Khor Qirqishan, just off Abu Dhabi island), Dibei (Dubai), Sarba (Sharjah), Agimen (Ajman), Emegivien (Umm al-Qaiwain), Rasalchime (Ra's al-Khaimah), Sircorcor (Khor al-Khuwair), Debe (Dibba), Chorf (Khor Fakkan) and Chelb (Kalba).

When the Portuguese under Albuquerque arrived in the area in the late fifteenth century, they noted Julfar among the coastal towns as a place with a fleet, and Duarte Barbosa writing in the sixteenth century recorded that the people of Julfar were merchants and navigators. Pedro Teixera speaks of boats from Bahrain and Julfar going each summer to the pearl fisheries further up the Gulf. He also mentions local pearl fisheries off Julfar. As the discovery of late Islamic ceramic scatters suggests, there was activity in this period on many of the western Abu Dhabi islands near the pearl beds and pearl oyster middens are frequently found on the islands, although many oysters were probably opened while the pearling boats were still at sea.

The Eve of Islam (*ca* fourth – seventh centuries AD)

Immediately before the coming of Islam, the eastern coast of Arabia was under the rule of several powers. In the north-east of the peninsula, the authority of the Bani Lakhm Arab kings of al-Hira (now in Iraq) had only very recently faded (*ca* AD 611). One of the principal tribes in eastern Arabia was ᶜAbd al-Qays while in the south-east, the tribe of Azd was beginning to dominate much of Oman, challenging the coastal foothold of the forces of the Sasanian Empire in Iran.

The Sasanian Empire and the Byzantine Empire constituted the two great international powers of the fourth to seventh centuries AD and their mutually destructive warfare forms the background to the rise of Islam, the new faith which was soon to overwhelm the Sasanians completely and greatly truncate the Byzantine state. The Sasanians had first established themselves on the eastern Arabian coast in the fourth century AD and during their wars with the Byzantines, they extended their authority as far as Yemen, where they appointed a governor at Sanᶜâ' in *ca* 570 AD. It was only with the coming of Islam in the seventh century AD that Sasanian power was swept from both Oman and Yemen.

Evidence of settlement in south-east Arabia during the emergence of Islam has only recently begun to surface as a result of archaeological fieldwork. Sasanian power in south-east Arabia was based on fortified strongholds such at those at Rustaq and Demetsjerd at Suhar, both in the Sultanate of Oman today (Kervran and Hiebert 1991: pp 337–343; Pirazzoli-t'Serstevens 1988: pp 87–105; Kervran 1996). Excavations at the tell of Suhar indicate a date for the site ranging from the first century BC to the second century AD through to the Sasanian period, and then from the seventh century AD to the thirteenth century AD, followed by a later Islamic occupation. A site associated with the Sasanian period is located at Jazirat al-Ghanam on the Straits of Hormuz, off the great headland of Musandam, now in the northern enclave of the Sultanate of Oman. Here, remains of structures are attributed to the early fourth century AD

on the basis of ceramic evidence (de Cardi 1973: pp 305–310; de Cardi 1975: pp 24–26).

It is interesting to note that 'Hellenistic' sites like al-Dur (Ed-Door) in Umm al-Qaiwain emirate and al-Milayha (Mleiha) in Sharjah emirate seem not to have continued beyond the fourth century AD, and appear to have been abandoned in the centuries that immediately precede the coming of Islam. Their relationship with the Sasanians has yet to be established.

To these fourth–seventh century AD sites must now be added the large tell at Kush in the Shimal area of Ra's al-Khaimah which is currently being excavated by Derek Kennet. He dates its foundation to the Late Sasanian/Early Islamic period. Kush was built as a fortified citadel with massive walls measuring on the east side 2.4 m in width and these still stand to some 2 m at their highest point (Kennet, Farid, Beech and Parker 1999: pp 4–5, pp 20–21). The earliest period of occupation at Kush is dated to the sixth–seventh century AD. Finds include ceramics and glass and a Sasanian seal of carnelian, decorated with a griffin motif. This seal is set in a silver mount and is dated to the third–seventh centuries AD. Ceramics imported from India were found in deposits from the early phases at the site and indicate trade between south-east Arabia and the Indian Ocean. Kush was to continue as a major site in the Islamic period, as the recent excavations have shown.

The presence of Indian pottery at Kush is important, fitting well with evidence from elsewhere of Indian Ocean trade and communications with the Near East in Roman and Sasanian times (Whitehouse and Williamson 1973: pp 29–49; Ball 1986: pp 106–110; Whitehouse 1991: pp 216–218).

Also from Ra's al-Khaimah, there is evidence of settlement in the Sasanian/Early Islamic period at Jazirat al-Hulayla and Khatt. Al-Hulayla is a low sandy island opposite Rams with a protected anchorage provided by the Khawr al-Khuwair (Kennet and King 1994: pp 167–169). Ceramic scatters across the island date settlement at the al-Hulayla site from the third to the eighth centuries AD, especially from the ninth to the eleventh centuries AD and then again from the fourteenth century to late Islamic times.

Khatt lies inland in the foothills on the borders of the emirates of Ra's al-Khaimah and Fujairah. Several archaeological tells of great antiquity lie amidst farmland and groves of trees, in an area with springs. Occupation of this fertile site goes back to the Late Stone Age, while ceramics indicating settlement in the first five centuries of the first millennium AD and in the Late Sasanian/Early Islamic period have also been retrieved (de Cardi, Kennet and Stocks 1994: pp 54–58).

On the eastern side of the Jebel Hajar, but of far less certain dating, is a site in Fujairah emirate, a well-constructed *falaj* in the Wadi Safad north of Fujairah city. It is locally said to be Sasanian, but although it is probably ancient, its origin is unproven (King and Maren 1999: pp 10–18).

Extensive modern development means that it is probably no longer possible to assess the archaeology of the towns of Umm al-Qaiwain, Ajman, Sharjah and Dubai in the sixth/seventh century AD and in the Islamic period generally. However, just to the west of Dubai, the important site of al-Jumayra goes back to the Sasanian and the Umayyad periods according to its first excavator, Baramki, although recent excavations by Dubai Museum suggest that the chronology will have to be revised in the light of new work at the site by Dr Husayn Qandil (Baramki 1975; Hellyer 1998: p 130). By the rise of Islam, sites like al-Dur (Ed-Door) on the Umm al-Qaiwain coast and al-Muwailah and al-Milayha (Mleiha)[3] had long since declined but where their successors as settlements are located, if anywhere, is unclear.

A very curious discovery that relates to the transition between the pre-Islamic and the Islamic period is a camel sacrifice and burial at Jebel al-Buhais near al-Madam in Sharjah. The excavation involved a male skeleton, accompanied by iron arrowheads and a camel. It is dated by C14 analysis of the contents of the camel's stomach to 640–680 AD with a 2σ deviation. The arrowheads suggest that the individual was a warrior (Uerpmann and Uerpmann 1999: p 456). The burial had taken place in a reused Bronze Age tomb: such reuse practices have been encountered at several graves in the Oman peninsula including at a grave at Jebel ʿImâla (Emalah) near to Jebel al-Buhais, at a date sometime between the Hellenistic and the Sasanian period (Benton 1994: pp. 12-13). However, the Jebel al-Buhais burial is unusual inasmuch as it is both so late and it is a precisely dated camel burial belonging to the period when the region was apparently under Al Julanda and/or Umayyad rule. The Jebel al-Buhais human and camel burial appears to be a continuation of earlier burial practices and camel sacrifice in a period of transition as the country gradually had its social practices transformed and the impact of Islam took grip. In the pre-Islamic period, camel sacrifice and burial rites have been well documented in recent years at al-Milayha, dated to *ca* 300 BC to *ca* 200 AD (M. Mashkour 1997: pp. 725-736; Uerpmann and Uerpmann 1999: pp. 455–456; Uerpmann 1999: pp. 102–118) and in Yemen (B. Vogt 1994: pp. 279–290). To these should be added an extremely interesting camel sacrifice found at al-Rabadha on the Darb Zubayda, to the east of al-Madîna in central Saudi Arabia, excavated in the mid-1980s but still unpublished. It involved a baby camel sacrificed and laid in the foundations of a doorway covered by the threshold stone of a doorway and in a firmly ninth or tenth century AD Abbasid context. Taken with the 'Umayyad-period' camel sacrifice at Jebel al-Buhais in Sharjah, these two camel sacrifices show the long persistence of camel-related sacrifice rituals across a great expanse of the Arabian landscape into a late period.

As in much earlier times, the plentiful water resources of Al Ain and Al Buraimi, the Tuwwam of the Arab geographers and historians, must have made the great inland oasis an important place in the Islamic period. Its numerous *falaj* systems show the longevity and the extent of organized settlement and cultivation there. The oasis is mentioned in the context of events of the Early Islamic period, but published archaeological accounts for the area on the eve of Islam or in the Islamic period generally are rare. A French team working in 1976 at Al Ain when the oasis was far less disturbed by modern development seems only to have found later Islamic material, dated to post-sixteenth century AD (Cleuziou 1976–1977: p 10).

A number of sites dating from the immediately pre-Islamic centuries have been recognized through archaeological surveys of the Abu Dhabi coastal region since 1992 (King, Dunlop, Elders, Garfi, Stephenson and Tonghini 1995: pp 63–74; King and Tonghini 1999: pp 117–142; Hellyer and King 1999: pp 119–123). Until recently, it had been assumed that the first settlement at the site of Abu Dhabi city was to be dated to 1761, but sherds retrieved from a now lost archaeological site at al-Batîn (al-Bateen) boatyard in Abu Dhabi city have been recognized as belonging to *ca* third to fourth century AD, pushing back the history of settlement on the island on which the capital city of the UAE stands by a thousand years. Ceramics of a similar date to those from al-Batîn have also been found at Ra's Bilyaryar, a headland on the mainland north-east of Abu Dhabi city.

Courtyard house north of the church at al-Khawr, Sir Bani Yas, Abu Dhabi emirate (1995).

Settlement of the same *ca* third to fourth century AD period is also proven on the offshore island of Yasat al-ᶜUlya', where there is also a small representation of Early Islamic ceramics. A significant site of similar date was found on the neighbouring island of Yasat al-Sufla', with remains of buildings indicated by low mounds that represent the traces of collapsed architecture. Sites of the same date are located on the island of Ufzaiyya and on the al-Silaᶜ mainland peninsula opposite. Yet another site of the same period and of some size was found on the island of Ghagha', one of a small group of islands in the westernmost waters of the UAE, close to the Saudi Arabia sea-frontier. Later Islamic structures were built over the site, although much remained to indicate the extent of the earlier occupation and its importance. Further out in the Gulf, ceramics of the centuries immediately preceding Islam have also been found on the island of al-Qarnayn (Qarnein), at Marawah, Dalma and at Ra's Ghumays on the Silaᶜ peninsula.

A survey by a French team in 1979 on the island of Dalma, near the town of the same name, noted a major building which they attributed to a Sasanian/Early Islamic date, although it has since vanished (Cleuziou 1976–1977: pp 10–15). Ceramics of *ca* sixth century AD date were recovered from a site on the outskirts of Dalma in 1992. Given the island's plentiful water supplies in the past, it seems very likely that it was a place of regional importance before the rise of Islam and also in the Islamic period itself, judging from Cleuziou's observations and our own.

One of the most remarkable discoveries on the Abu Dhabi islands for this period before the coming of Islam has been made at al-Khawr (al-Khor) on the island of Sir Bani Yas, off the coast at Jebel Dhanna. The landscape of the island has been changed by landfilling and extensive tree planting in recent years, but at al-Khawr, on the eastern side of the island and

in an undisturbed area, a group of sites was identified in 1992. These include several courtyard houses and a large occupation mound, now recognized as a Nestorian monastery and church (King 1997: pp 221–235). Carbon 14 dating of burnt material retrieved from the monastery indicates occupation to the mid-seventh century AD which matches the sixth to seventh century AD date of the pottery excavated at al-Khawr.

The structures so far exposed at al-Khawr were reduced to wall foundations, but they were all remarkably well preserved, with a fine plaster finish on the internal wall surfaces and floors. The monastery consists of a rectangular enclosure with chambers surrounding a central courtyard and a church that stands in its centre at the highest point. In the course of the excavation numerous pieces of fine decorative plaster were recovered, with relief motifs of grape leaves, grape clusters and Christian crosses of the same character as the decoration of other Nestorian sites of similar date elsewhere in the Gulf, at Failaka' (Kuwait), al-Jubayl (Saudi Arabia), at the Bani Lakhm capital of al-Hira (Iraq), and at al-Kharg island (in Iran)[4].

The al-Khawr church is on an east-west axis, measuring at least 14 m in length and it has three aisles. When abandoned, it eventually collapsed with the east wall falling on to its own decorative plaster, thus protecting and preserving a large amount of the decoration that once covered the building on the exterior and possibly on the interior. The original design seems to have consisted of string courses decorated with grape clusters, vine leaves and crosses that ran as bands across the building.

During excavations at the western end of the island of Marawah in 2000 season, yet another church was identified. Although only the apse at the east end of the building was exposed, its dimensions and the quality of its undecorated internal plaster facing tied it stylistically to the al-Khawr church at Sir Bani Yas with which, at present, it is assumed to be comparable and contemporaneous. Near to the newly found Marawah church is a complex water catchment system that utilizes the natural configuration of the bedrock and man-made deflectors to guide rainwater run-off to make it pool. In the arid environment of the Abu Dhabi islands this skill in water management seems to have persisted from the Late Stone Age down to the Late Islamic period. While we hesitate to date the origins of this water deflector system on Marawah at present, it is tempting to associate its use with the nearby church. Certainly, if the water gathering system is as old as the sixth to seventh century AD, it is hard to imagine that those who used the church did not exploit this source of water. Other evidence, based on provisional C14 dating from two lime kilns from the west end of the island point to use in *ca* 726 and *ca* 826 respectively. It is thus increasingly apparent that there is a significant level of activity on western Marawah as well as at al-Khawr at Sir Bani Yas and at Dalma in the centuries immediately before Islam and in the Early Islamic period.

The presence of churches in eastern Arabia conforms to the Arabic textual accounts of Christianity in the east of the peninsula at the time of the coming of Islam. The Bani Lakhm Arab kings of al-Hira in south-west Iraq were Nestorian Christians and their role was that of a buffer state for the Sasanians in their conflicts with the Byzantines and their allies in the deserts of Arabia and Syria. Other Arab tribes were also Christian, including Bani Taghlib in north-east Arabia and the north Arabian and Syrian tribes of Ghassan, Kalb and Judham, while Christianity was established in Yemen before Islam at San^{c}â', Najran and at Zafar as well as in the broader context of the Indian Ocean (Fiaccadori 1992).

The ecclesiastical arrangements of the Nestorian church in eastern Arabia are reasonably well understood. The Nestorian province of Bet Qatraye included Bahrain and the coast opposite to it, the al-Hasa' oasis and Qatar, and it was divided into a number of bishoprics. Further to the east was Bet Mazuniye, which encompassed the modern Sultanate of Oman and territory now in the UAE. The centre of Bet Mazuniye was Suhar on the Batinah and the names of several of Bet Mazuniye's bishops are known. As we have seen, for the Arab geographers, all of south-east Arabia, including the territory of the UAE, was 'Oman', and the Syriac term 'Mazuniye' signifies this same broad geographical territory. It seems reasonable to assign much of the UAE to the territory of Bet Mazuniye rather than to Bet Qatraye. However, the location of the boundary between Bet Qatraye and Bet Mazuniye is unclear and Sir Bani Yas with its monastery at al-Khawr and that at Marawah are very close to wherever this ecclesiastical boundary must have been. It is therefore difficult at present to be sure to which ecclesiastical division the al-Khawr monastery belonged.

The Syriac sources speak of the foundation of monasteries in the Gulf as early as the fourth century AD and the presence of a church or monastery on at least one Gulf island is indicated. In 676 AD, bishops of the Nestorian church attended a council at Darin on the island of Tarut, off the Saudi Arabian coast, after visiting unspecified islands, presumably to meet other clergy residing there. This sounds very much like a reference to Sir Bani Yas, Failaka' or Kharg. It is to this world of pre-Islamic Nestorian Christianity on the coasts and islands of the Gulf and with contacts out into the Indian Ocean that the Sir Bani Yas monastery belongs.

Christianity persisted in eastern Arabia for several centuries after the coming of Islam but eventually it seems to have faded, supplanted by the dominant new faith. It appears to have simply eroded away, perhaps because of conversion to Islam, and churches like that on Sir Bani Yas or Marawah would have been abandoned to deteriorate until they finally collapsed.

Little is known of the pre-Islamic history of the south-east Arabian tribes to whom many of these post-third century AD archaeological sites must relate. The Azd, led by their Al Julanda princes, had originated in Yemen and they seem to have been the principal tribal group in Oman but there were non-Azd tribes as well, established in the present territory of the UAE and the Sultanate of Oman; the descendants of the non-Azd tribes were to be known as Nizar in later times.

The al-ᶜAtik branch of Azd was found at Dibba on the Batinah coast of the UAE, while another branch, Huddan, resided along the modern UAE coast between Ra's Musandam and Qatar: yet another, Humaym, was at Nizwa. Elements of the Azd were also located on the islands of the Gulf, both on the Arabian and on the Iranian side, before the rise of Islam.

Of the little that is known of the pre-Islamic Azd, it is clear that they were seamen, merchants and fishermen. Hisham ibn al-Kalbi says that, along with the northern Arabian tribes of Tayyi' and al-Qudaᶜa, the Azd worshipped an idol called Bajir or Bajar before Islam (Ibn al-Kalbi 1952: p 54), although this deity may have belonged to a branch of Azd who lived somewhere in the north of the peninsula rather than in the south-east (Ibn al-Kalbi 1952: p 54). However, the excavations at Sir Bani Yas and elsewhere in eastern Arabia add to the growing body of evidence of the presence of Christianity in the pre-Islamic Gulf, suggesting a religious picture more complex than one confined to paganism alone. A local tradition, current in the UAE, holds that part of the Manasir were Christian before the coming of Islam. The archaeological evidence from pre-Islamic Nestorian church sites makes such a tradition seem plausible.

The Advent of Islam (622–661 AD)

The sources for the history of the UAE in the Early Islamic period are either the Arabic historians and geographers who wrote under the Abbasid Caliphate or the very much later compilations based on early but lost works. For the early years of Islam, such sources as we have are occasionally informative, dealing with certain incidents in some detail. Such episodes as are recorded touch on the lifetime of the Prophet Muhammad, the Rightly Guided Caliphs and their Umayyad and Abbasid successors. The events they describe either relate to the conversion of the country to Islam or to military matters. Yet, although the literary sources record certain episodes, silence prevails for much of the Early Islamic period and it is only archaeological research in recent years that has broadened the scope of our understanding of the history of the UAE in the Islamic period as a whole.

Before the arrival of Islam to south-eastern Arabia, the Sasanians in Oman were already in conflict with the Azd tribe and their Al Julanda kings. The balance in this conflict swung in favour of the local Arabs when the Al Julanda were joined by Muslim forces sent by the Prophet Muhammad from al-Madîna, and in the resulting military campaigns the Sasanian citadels were overwhelmed and their forces expelled by 630 AD. The Sasanians had suffered a catastrophic defeat in Iraq at the hands of the Byzantine emperor Heraclius over the previous two years and the success of the Muslims and the Al Julanda in south-eastern Arabia presaged the subsequent Muslim victories over the Sasanians that were to lead to their total defeat and the disintegration of their empire in Iran 20 years later.

At the time of the coming of Islam, the leadership of the Arabs of south-east Arabia was a matter of dispute. The Al Julanda ruling house of the tribe of Azd was led by two brothers, Jayfar and ᶜAbd (or ᶜAbbad), and they were centred on the Batina coast at Suhar. They were in conflict with the al-ᶜAtik branch of the Azd who lived mainly in the interior of the country. The latter were led by Laqit b. Malik al-ᶜAtiki, who seems to have lived at Dibba. According to Ibn Habib, however, Dibba was also sometimes under the control of the Al Julanda, for on the last day of the month of Rajab, they would administer an annual fair there, one of the great markets of pre-Islamic Arabia (Potts 1992: p 339). Ibn Habib records that Dibba was one of the two ports used by the Arabs of south-east Arabia, Suhar being the other. Merchants would came from Sind, India and China for this fair. If not an exaggeration, this provides further evidence of the breadth of Indian Ocean trade before Islam, although it seems unlikely that merchants from China arrived at this early date in Arabia and the most authoritative discussion of the pre-Islamic China trade, by G.F. Hourani, argues decisively against this possibility (Hourani 1995: pp 46–50). Although Dibba is mentioned in the Arabic sources as an important place, archaeological reports do not offer much evidence to indicate its character on the eve of Islam or in the Early Islamic period (de Cardi 1971: p 257). However, a graveyard associated with a major battle in the Early Islamic *Ridda* wars of the Caliphate of Abu Bakr is located close to Dibba (Hellyer 1990: pp 48–49; Hellyer 1998: p 127).

The territory that now constitutes the UAE emerges into view in the context of the Prophet Muhammad's invitation to the people of south-east Arabia to convert to the new faith of Islam. Knowledge of the Prophet's message seems to have seeped into south-east Arabia, as well as to al-Hasa' and Bahrain in eastern Arabia, before large-scale conversion and acquiescence to

the new faith occurred. The area also figures prominently in the events of the *Ridda* (Apostasy) wars of 632–634 AD.

As we have seen, about the time that the first contacts were made between south-east Arabia and the Islamic community at al-Madîna, the Sasanian state was engaged in warfare with the Byzantines which was to lead to the decline of both empires as international powers. In this same period, the Azd appear to have been bringing pressure on the Sasanian outposts along the coast. In 630 AD, the Prophet Muhammad sent as a missionary to the Azd one of his Companions, Abu Zayd al-Ansari, from the Madînan tribe of Khazraj, who was known for gathering pages of the Qur'an during the Prophet's lifetime. The Prophet then sent a newly converted member of Quraysh, ᶜAmr b. al-ᶜAs, the future founder of al-Fustât in Egypt. According to a late source, there had been contacts with Oman even earlier, with Mazin b. Ghadubah being the first individual from south-east Arabia to accept Islam when he went to the Prophet at al-Madîna and converted there (Sirhan 1984: p 9).

Subsequently, ᶜAmr b. al-ᶜAs arrived bearing a letter from the Prophet, passing through Tuwwam (Al Ain/Al Buraimi) before continuing to the Batina coast to present the letter to the Sasanian governor who rejected the Prophet's message. ᶜAmr, now joined with Abu Zayd, then went to the Al Julanda kings of the Azd, either at Demetsjerd, the citadel built by the Sasanians at Suhar, or at Nizwa, and presented the Prophet's letter to ᶜAbd. ᶜAbd recognized the importance of the matter and passed the letter to his brother Jayfar. They agreed on its significance and said that they needed to consider the matter at length. A council of the Azd was called at which it was decided that they should convert to Islam. The Prophet's message was accepted by all their kin, who agreed to pay the Qur'anic *zakat* tax. Jayfar then invited all the people in Oman to submit to Islam. Among others places, he sent messages to Dibba, and to the furthest flung parts of Oman to the north, by which the territory of the UAE is probably intended (Sirhan 1984: pp 9–10).

The conversion of the Al Julanda and the Azd to Islam now became tied to the existing hostility between the Azd and the Sasanian government. The Sasanians maintained their rejection of Islam and, led by the Al Julanda princes, the Azd attacked them, killing Maskan, the Sasanian administrator of Oman, and besieging the rest of their forces in the citadel of Damsetjerd where they finally surrendered in 630 AD. The defeated Sasanians agreed to evacuate the country and to relinquish all their gold, silver and property.

With the Sasanians expelled, ᶜAmr continued to administer Oman until the Prophet's death in 632 AD and the succession of Abu Bakr, the first Caliph. ᶜAbd, the Julanda prince, went to al-Madîna where he was received with pleasure by the newly appointed Caliph who praised the conversion of the people and wrote to them to compliment them. The point at which this happened is unclear, however, for at the death of the Prophet, the great uprising known as the *Ridda* (or Apostasy) wars broke out against Islamic rule in much of Arabia. Central Arabia followed a false prophet, Musaylima, while in the east and south, rebellions took place all the way from Bahrain to Oman, Mahra and Yemen. The famous Muslim general, Khalid b. al-Walid, was despatched to al-Yamama in central Arabia by the Caliph to put down Musaylima and while Khalid suppressed this threat, other commanders were deployed in eastern Arabia. Al-ᶜAla' b. al-Hadrami was sent to reduce the apostates of Bahrain (the eastern coast of Arabia and the island of the same name) while Hudhayfa b. Mihsan al-Ghalfani, of the Yemeni Himyarites, and Arfaja al-Bariqi, an Azdi, were sent to suppress apostates in south-east and southern Arabia.

Abu Bakr ordered Hudhayfa to advance with all speed on Oman, where he was to be supported by Arfaja. In Oman, they were to support the Muslims, reinforcing the Al Julanda princes, ᶜAbd and Jayfar, against their opponents, the dissident Azd elements. The expedition was then to continue into Mahra on the southern coast, where Arfaja would command. They were reinforced by ᶜIkrima b. Abi Jahl, who had been engaged with Khalid b. al-Walid in the campaigns in central Arabia against Musaylima. After suppressing the apostates in Oman and Mahra, the Caliph ordered that the Muslim forces should continue through the Hadramawt to Yemen, to join up there with al-Muhajir b. Abi Umayya and his Muslim forces already operating in Yemen.

The Caliph's plan of campaign responded to the nature of the topography of the south of the Arabian Peninsula, and the natural obstacle of the immense Empty Quarter sand sea. This forced the Muslim army to march from al-Madîna through central Arabia in a great circuit along the north side of the sands and then to pass through territory that today lies in the UAE, to reach the Oman Peninsula. They then turned south-west and west towards southern Arabia, to Mahra', Dhufar and to Yemen. Although there is evidence in later times of armies that must have crossed the edge of the sands in the UAE to reach Julfar, the Batina and the interior of Oman, only this Early Islamic army from al-Madîna seems ever to have circled the whole of the Empty Quarter.

Any large force moving through the UAE from central or northern Arabia by land must march between the deep sands of the eastern Empty Quarter and the *sabkha* salt-flats of the coast, which are especially difficult when the weather is wet in winter and spring. For travellers, access to wells in the Baynuna, Liwa or Tuwwam (Al Ain/Al Buraimi) areas is vital until the more plentiful water sources of the Jebel Hajar and Jebel Akhdar are reached. The difficulty of finding wells when traversing this harsh desert area in south-east Saudi Arabia and in western Abu Dhabi emirate is illustrated graphically by Wilfred Thesiger's account of his journey from Jabrin to Dhibi and the Liwa in 1948 (Thesiger 1971: pp 233–244). It was awareness of the nature of the desert landscape and the location of the limited water resources that dictated the Caliph Abu Bakr's plan of campaign and the route of his forces around the south-east of the Arabian Peninsula to Yemen. Like any traveller in the pre-modern period, dependent on wells, and travelling by camel, Abu Bakr, as a native of the distant Hijaz, or his commanders, must have sought the advice of local people from the tribes of south-east Arabia who would have had the same detailed knowledge of the Empty Quarter that their descendants among the tribes of the area still retain today. It was as part of this process that Arfaja al-Bariqi, as an Azdi, and Hudhayfa b. Mihsan al-Ghalfani, as a Himyari of Yemen, were selected to lead the expedition, not only because of the connections that their own tribal affiliations gave them politically in Oman and southern Arabia, but also because of the tribal contacts and access to guides that they would have had in the areas through which the Madinan Islamic force passed in its great march around the Empty Quarter.

In Oman, the leader of the apostasy was Laqit b. Malik al-Azdi, known as 'the one with the crown' (Dhu'l-Taj), a figure of some importance in pre-Islamic times as a rival of the Al Julanda rulers of the country (al-Tabari, ed. Donner: pp 151–155; al-Baladhuri 1916: p 117). With the death of the Prophet Muhammad, Laqit rebelled and worsted the forces of the Julanda leaders and the Muslims in Oman. Al-Tabari says that, as a result of Laqit's initial successes, ᶜAbd and Jayfar were forced to seek refuge in the mountains and the islands off the coast, while Laqit dominated the rest of the country. The mountains must mean Jebel Hajar and

Jebel Akhdar that form the great spine running from the Sultanate of Oman through the northern emirates of the UAE up to the Straits of Hormuz at Musandam. The islands mentioned are presumably those off the shore of the UAE and Oman and where Azd are known to have been present before Islam. In these more remote areas, the Al Julanda leadership awaited reinforcements from al-Madîna.

The combined force of the Madinan army led by Hudhayfa and supported by Arfaja and ᶜIkrima reached Riyam or Tuwwam, places which are recognized by Miles as being identical with Al Ain/Buraimi (Miles 1966: p 36). Using Al Ain as a base, the Madînan forces made contact with ᶜAbd and Jayfar who then met them at Suhar on the coast of the Batina in Oman. The Muslim forces, including those from south-east Arabia and from al-Madîna, now set about fragmenting the apostates, writing to the chiefs of tribes that had supported Laqit b. Malik. The first to be approached was the leader of the Banu Judayd, who decided to abandon him. When they felt that the apostates were weakened, the Muslim army advanced to meet Laqit at his base at Dibba which is described by al-Tabari as a great market and *misr* or town. As we have seen, Ibn Habib confirms the extent of Dibba's trading network. Dibba was sometimes the capital of Oman and is said to have been garrisoned by the Sasanians before Islam (Donner in al-Tabari 1993: p 153, n 964).

A battle broke out between the two sides at Dibba, somewhere on the plain just inland from the present coastal town to judge by the location of the graves where those lost in the battle are buried. Laqit strengthened his followers' intention to resist by placing their women and children behind his position so that their presence would encourage his men to fight to protect their families. Initially, Laqit was dominant, but the Muslims, reinforced by other tribes (including members of ᶜAbd al-Qays and elements from Bani Najiya of the Qudaᶜa, who had settled in Oman before Islam), finally prevailed and Laqit's followers fled, leaving many dead. According to al-Tabari, 10,000 died although numbers are often exaggerated in the Early Islamic texts, and may merely indicate 'a large number'.

The victorious Muslims proceeded to loot the market at Dibba. The captives seized were sent to Abu Bakr with one fifth of the booty, which included the enemy's flocks. Hudhayfa remained in south-east Arabia where Abu Bakr appointed him governor, an office that he held after the death of the Caliph in 634. He calmed the situation with the tribes, and all of the Azd returned to Islam while the rest of the Muslim forces from al-Madîna and from the people of Oman continued to pursue the apostates into Mahra in southern Arabia before marching to Shihr in Yemen. Al-Tabari describes this army as including people from the seacoast and from the islands, as well as from the incense country and from Najd (al-Tabari 1881–5: pp 156–157). One must assume that the Gulf islands are indicated in this reference.

The Invasion of Iran

In *ca* 637 AD, according to al-Tabari, the governor of the province of al-Bahrayn, ᶜUthman b. Abi al-ᶜAs, was ordered by ᶜUmar b. al-Khattab, the second Caliph, to attempt to invade the coast of Sasanian Iran. The Muslim forces were 3000 strong and consisted of men from Azd, ᶜAbd al-Qays, Najiya and Rasib. They set out by sea from Julfar and sailed across the Gulf to the island of Ibn Kawan (Qays) where they encountered the Sasanian governor of the

island whom they defeated (al-Tabari 1881–5: p 2698). They then continued to invade the coast of Fars and the Iranian interior. It is not clear exactly what Julfar was at this stage but it is evident enough that it had a port. Given that the archaeological site now known as Julfar, lying just north of Ra's al-Khaimah city, is dated post-fourteenth century AD, Early Islamic Julfar and its harbour must have been elsewhere. It is possible that the name Julfar moved around the coastal plain near Ra's al-Khaimah over time and its harbour moved as anchorages changed when its creeks silted and offshore sand-bars built up, making navigation difficult. A major result of geomorphological study at post-fourteenth-century Julfar has been to demonstrate the instability of the shore and the hinterland, and the rapid change of the coast in very recent centuries. These processes must have had their effect on settlement in very much earlier times.

The Umayyad and Abbasid Periods (661–1258 AD)

With the death of the third Caliph ᶜUthman b. ᶜAffan in 656 AD, the Muslim community fell into contention between the fourth Caliph, ᶜAli b. Abi Talib, and the Umayyad governor of Syria, Muᶜawiya b. Abi Sufyan. The Umayyads came to power as Caliphs themselves in 661 AD on the assassination of the Caliph ᶜAli, but the people of Oman remained aloof, ruled by their Al Julanda princes. It was not until some time towards 705 AD that al-Hajjaj b. Yusuf al-Thaqifi, the powerful governor of the eastern Islamic world under the Umayyad Caliph ᶜAbd al-Malik, launched an attack on south-east Arabia to bring it under Umayyad control.

To end south-east Arabia's autonomy, the Umayyads sent a fleet and army that marched by land to Oman (Sirhan 1984: pp 10–11; Salal b. Razik 1871: pp 2–5). The fleet landed at Julfar which served as a naval base for the expedition for the course of the campaign. The first Umayyad forces were defeated by the Azd and the Umayyad general, Qasim b. Shiᶜwa, was killed. Faced with this reverse, al-Hajjaj despatched another army, 40,000 strong, to Oman under Qasim's brother, Mujaᶜa. This force was divided so that the horses and camels travelled by land while the army went with a fleet by sea. The land force must have crossed the UAE to reach the rendezvous but there is no indication as to the route they followed. Given the dangers of the shallow coastal waters and the difficulties of the *sabkha*, it is impossible that the army and the fleet could have maintained visual contact with each other as they travelled through what is now the UAE.

The Umayyad land force was defeated by the Azd at a water source some days from a place called Bushir or Balqaᶜa which has been identified by Badger with al-Falj (Falaj) and which is mentioned by al-Idrisi (al-Idrisi 1972: p 153). He places it near to Julfar (Badger in Salal b. Raziq 1871: p 3, n 2). The Umayyad land force fled, but the fleet landed at a place called al-Bunana, which could be synonymous with Baynuna in Abu Dhabi emirate. However, Baynuna as understood today is a district with wells that is far inland, and if the term was used for a larger area in the eighth century AD, it would have had to include the coast for this identification with al-Bunana to be meaningful. Yet even if this is true, it would have been of little advantage for the Umayyad fleet to have landed as far west of Julfar as the coast of the Western Region of Abu Dhabi and the areas of the coast north of modern Baynuna, since they are not provided with good anchorages for a large fleet. It seems, therefore, that another source

(Salil b. Raziq 1871: p 4) is more accurate, recording that the Umayyad fleet's landing place was al-Yunaniya of Julfar. This seems to mean that al-Yunaniya was a part of the broad district called Julfar, and thus should be located somewhere in the present emirate of Ra's al-Khaimah, in the north of the UAE.

When the Umayyad fleet reached Julfar, an individual from Tuwwam came to inform them that a dispute had arisen among the Azd after their defeat of the Umayyad land army. The Umayyad sea-borne forces that assembled at Julfar under Mujaᶜa were superior to the Azdi force that remained in the area under Saᶜid b. ᶜAbbad, the brother of the Al Julanda leader, Sulayman. Faced with the superior Umayyad forces, Saᶜid retreated by night into the mountains with the Umayyads in pursuit.

Meanwhile, the Umayyad fleet of 300 vessels sailed through the Straits of Hormuz to anchor at Muscat harbour. The Julanda leader, Sulayman, managed to burn more than 50 of the Umayyad boats, while the rest fled. Sulayman then attacked and put to flight the main Umayyad army under Mujaᶜa. Mujaᶜa retreated to his headquarters at Julfar with the remaining boats and wrote to al-Hajjaj in Iraq, requesting reinforcements. In response, al-Hajjaj sent Mujaᶜa 5000 cavalry from Syria who marched by land to Julfar. Thus strengthened, the Umayyads overcame the resistance of the Julanda and the Azd and defeated them. In the aftermath of the victory, the Umayyads appointed Sayf b. al-Hani al-Hamdani as governor of Oman. The Julanda leadership fled to the land of the Zanj – east Africa – and only re-emerged as a power in south-east Arabia later in the Umayyad period. The south-east Arabian sea trade that must have existed in pre-Islamic times with other Indian Ocean littoral countries probably prompted the destination of the Al Julanda flight, an episode which presages subsequent south-east Arabian connections with east Africa in the Islamic period.

When the Abbasid Caliphs seized power from the Umayyads in 750 AD, they soon turned their attention to Oman to put down a revival of the Julanda and Azdi independence which appears to have re-emerged by the later Umayyad period. This seems to have affected not only the mainland of south-east Arabia but the islands of the Gulf as well. The first Abbasid Caliph, al-Saffah, sent an army to Oman led by Shiban b. ᶜAbd al-ᶜAziz al-Yashkuri to ensure the allegiance of Julanda b. Masᶜud, the Azdi leader. The Abbasid fleet sailed from al-Basra to Ibn Kawan island on the eastern side of the Gulf and then on to Oman, although the harbour that they used is not mentioned. However, Shiban was killed in the fighting that ensued with the Azd. Even before Shiban's death, the Caliph had decided to send a new commander, Khazim b. Khuzayma, to help confront the Azd.

Khazim arrived after Shiban's death. He sought the allegiance of the people of the country to the Abbasids, but they refused to support him. The Abbasid forces killed the leaders of Julanda and 10,000 of their supporters, according to al-Tabari. This final battle took place at Julfar.

According to al-Tabari, during the fighting, Khizam's Abbasid forces burnt the houses of the Julanda followers, using naphtha to hasten the flames. When they saw their houses burning, the Al Julanda army fled from their prepared positions to protect their families and this allowed the Abbasid army to fall upon them and slaughter them. There is a long tradition of using wooden and reed housing in the Gulf and around the Arabian coast. As early as the Late Stone Age we find post-holes at an Ubaid period site at Dalma indicating the presence of huts and the archaeological and literary evidence shows that similar huts were still in use as late as the

nineteenth and early twentieth centuries AD. These are usually called *barasti* by Europeans but are more correctly known as *ᶜarish.* The episode of the burnt houses of the Julanda army suggests that a substantial number of the houses of Julfar were *ᶜarish* in the early Abbasid period. This is the first textual information describing structures at Julfar that gives some impression of the common housing of the UAE coast.

A far more destructive Abbasid intervention occurred when the Caliph al-Muᶜtadid came to the throne in 892 AD. As the Abbasid governor of Iraq and the Gulf, Muhammad b. Nur approached the Caliph with a plan to support anti-Ibadhi forces (or anti-Julanda forces) in south-east Arabia, in order to obliterate the Ibadhis and their Julanda leadership, bringing south-east Arabia back under the direct rule of the Caliphate (Miles 1966: pp 77–84; Salil b. Razik 1871: pp 22–25).

A large Abbasid force set out, including members of the north Arabian tribe of al-Tayyi'. The force consisted of 25,000 men and included 3500 armoured cavalry. Stores and equipment were sent by a fleet that was to land at Julfar, while the rest of the army under Muhammad b. Nur marched through eastern Arabia to secure Julfar by way of the interior. They would have followed a route through modern Abu Dhabi and Dubai to reach the northern emirates, just as the forces of the Caliph Abu Bakr and of the Umayyads had done in earlier times. Having established his naval base at Julfar to ensure communications by sea with al-Basra at the head of the Gulf, Muhammad b. Nur marched inland to Tuwwam, before advancing on Nizwa. The strength of his army was such that the local people were overwhelmed. Nizwa, the main town of Oman and of the Azd, was seized by Muhammad b. Nur and the local forces were routed. Some fled to Shiraz and al-Basra, while others went to Hormuz across the Gulf. In the brief uprising which followed, Muhammad b. Nur was initially driven back and defeated at Dibba but he recovered to unleash his army on the area. In the ensuing campaign of terror and destruction, much of south-east Arabia was wrecked. Muhammad b. Nur's army set about killing and torturing the people and breaking up the infrastructure by filling the *falaj* irrigation system, on which the agricultural economy of so much of south-east Arabia depended. The Abbasids also burnt books, which is probably the cause of the paucity of early sources on south-east Arabia's Islamic history.

While Muhammad b. Nur was ravaging Oman and laying the country low for decades to follow, an increasing level of disruption in many other parts of the Abbasid Caliphate was taking place as Baghdad began to lose control of its more outlying provinces. By the end of the ninth century AD, the power of the Abbasids was greatly diminished, with the Caliphs controlled by their Turkish military commanders and many provinces lost to the *de facto* power of their local governors. The Abbasids also lost parts of the Gulf during the great Zanj rebellion in southern Iraq, a revolt which though once represented as a slave uprising has also been described as a conflict over the control of Gulf trade. The Zanj sacked al-Basra in 871 AD and continued to represent a threat to the Abbasids. Not long after, the massively disruptive Qaramita state, based in al-Hasa' and Bahrain, arose in eastern and northern Arabia. The Qaramita sectarians raided over the whole of Arabia, destroying the security of the pilgrim road from Iraq to the Hijaz, and raiding Syria. They sacked al-Basra in 923 AD and made forays into Oman and Yemen. In 930 AD, with great sacrilege, they attacked Mecca during the pilgrimage season and seized the Black Stone from the Kaᶜba, bearing it off to eastern Arabia where it remained until 951 AD when the Qaramita returned it.

On the opposite side of the Gulf, events in the course of the tenth century AD were also grave for the great regional trading centre of Siraf on the coast of Iran. Siraf had flourished since the Sasanian period but it suffered an earthquake in 977 AD, after which it declined. As the town's commercial dominance faded and other centres supplanted it, the Siraf merchants scattered as far as the Red Sea and east Africa. Beneficiaries of the decline of Siraf seem to have included Ibn Kawan (*i.e.*, the island of Qays on the Iranian side of the Gulf), and Suhar in Oman. Suhar's heyday as a trading and agricultural centre appears to have occurred in the tenth century AD. The occupation of Kush and al-Hulayla in Ra's al-Khaimah in the ninth to eleventh centuries and thereafter may suggest that they too were a part of the efflorescence of south-east Arabia in this period.

After the withdrawal of the Qaramita from south-east Arabia in 965 AD, the Buwayhid *Amir* of Kirman, Muʿizz al-Dawla, invaded Oman. He joined his son, ʿAdud al-Dawla, at Siraf before landing their combined force with a fleet at Julfar to bring the country under their control. When the Buwayhid position was subsequently threatened, they sent forces again in 972 AD and ʿAdud al-Dawla took south-east Arabia under his direct rule. The Buwayhids remained a power in Arabia until some time before 1053 AD when their authority waned. In 1055 AD, the Buwayhid state in Iraq and Iran was overthrown by the Seljuk Turkish Sultans.

The principal line of this Turkish regime, the Great Seljuk Sultans based at Isfahan, reinstated the power of the Abbasid Caliphate in Baghdad. They established the foundations of a Sunni Islamic revival across much of the Islamic world in their westward advance from Central Asia as far as Syria and Anatolia. In south-east Arabia, their presence is scantily recorded, but Ibn al-Mujawir mentions a Seljuk prince of Kirman who also held Oman and this connection may have sustained itself until the fall of the Seljuk dynasty in Iran in 1186 AD.

The Early Islamic Archaeology of the UAE

Until recently, there has been a great lack of archaeological information concerning the seventh to thirteenth century AD in the UAE but there is now a growing body of evidence from sites associated with the Umayyad and the Abbasid periods. This is especially the case in the northern emirates of the UAE.

One of the most important of these sites is Kush in Ra's al-Khaimah whose sixth/seventh century AD citadel, already discussed above, seems to have been abandoned in the Early Islamic period. An Abbasid period re-occupation followed in the ninth to tenth centuries AD, peaking between the eleventh century and the mid-fourteenth century AD. Among imported finds uncovered during the 1998 excavations at Kush were two eighth/ ninth century AD Dusun potsherds from China, while Indian pottery, as noted above, was found from the earliest phases at the site. These reflect the Arabian sea-trade with the Far East via the Indian Ocean known from literary sources to have flourished in the Early Islamic period (Hourani 1995: pp 61 ff). While there is plentiful evidence of Far Eastern ceramics at UAE archaeological sites from the fourteenth century AD onwards, this trade is not well testified in archaeological terms at an earlier date, hence the significance of the presence of the Indian and Far Eastern Dusun sherds found at Kush.

Archaeobotanical finds retrieved from Kush also include coffee beans from thirteenth century AD levels. These are especially interesting as they provide the earliest dated indication of the use of coffee so far found anywhere in the Arabian Peninsula (*Anon*. 1996).

As we have already seen, Jazirat al-Hulayla on the coast north of Ra's al-Khaimah emirate was settled in the Sasanian/Early Islamic period but it saw an efflorescence during the Abbasid period. Excavations at al-Hulayla by a Japanese team proving a ninth to tenth century period occupation match the earlier results of Kennet's survey that had pointed to the peaking of settlement on the island in the ninth to eleventh century AD period (Kennet and King 1994: pp 167–169; Sasaki 1995: pp 1–23). Much of the archaeological evidence at al-Hulayla is in the form of ceramic scatters, but the Japanese excavations have demonstrated more concretely the Abbasid period occupation of the island.

Yet another site occupied during the same period is the inland fortress at Shimal, near Ra's al-Khaimah, known variously as the Palace of Sheba, Za^{c}ba, or Zabba and also known as *Husn Shimal*. The excavators suggest that the fortress reached its most elaborate development in the tenth and the thirteenth centuries AD. Although the site shows evidence of an early period of occupation, subsequent clearance and rebuilding has led to the loss of material information relating to this earlier occupation. It is also suggested that a large flood deflector running across the Wadi Sur near the Palace of Sheba was first constructed in the ninth to twelfth centuries AD. This deflector served to send flood water descending from the highlands away from the Wadi Sur towards the dense band of palm-groves and gardens that lie in the hinterland of modern Ra's al-Khaimah city. Surveys associated with excavations at Wadi Haqil, also near Shimal and close to Sheba's Palace, have identified two sites tentatively interpreted as farms and occupied between the Early Islamic period and the thirteenth/fourteenth century (Stocks 1996: pp 145–163).

Kush, al-Hulayla, the Palace of Sheba and the Wadi Haqil sites are all close to each other and appear to be approximately contemporary, indicating a significant level of settlement activity in the hinterland of Ra's al-Khaimah city in the Early Islamic period. This period also sees an efflorescence of settlement at Suhar, as we have seen, and in the interior on the eastern side of the Oman peninsula mountains. Behind Suhar, there is also evidence that the *falaj*-irrigation supported agricultural regime reached its greatest extent in the fourth to tenth centuries AD. This irrigation regime was associated with the Wadi Jizzi that flows from the direction of the highlands and Al Ain/Buraimi down towards the Batina behind Suhar.

There is further literary and archaeological evidence of settlement in the Early Islamic centuries from elsewhere in the UAE. Al-Hamdani writing in the tenth century knew of a great *hisn* or fortress of the Bani Riyam in Oman (al-Hamdani 1884/I: p 52) but he does not say where it was located. The fortress is presumably the Riyam which Miles associates with Tuwwam (Al Ain/Al Buraimi). Yaqut al-Hamawi in *ca* 1225 AD also speaks of a citadel or fortress (*qasaba*) at Tuwwam.

A significant but still little understood archaeological site for the earlier Islamic period is that at Jumeirah, just west of Dubai. As we have seen already, the first excavator of the site, D. Baramki, suggested that it originated in the Sasanian period (Baramki 1975), but the presence of classic Abbasid glazed wares implies that the site continued in use at least into the ninth century AD. However, until the excavations at Jumeirah led by Dr Husain Al Qandil of Dubai Museum are published, it would be premature to estimate the origins and longevity of this important site.

Excavations at Julfar (1991). In the centre of the picture is the excavation of the five successive mosques carried out by the British team. Beyond is the area excavated by the French team.

From Dalma, also in the west of the UAE and the principal source of sweet water in the area, there is also evidence from a graveyard in the modern town of Early Islamic pottery. This is of great interest, for, so far, very little evidence has been found of activity in the western areas of the UAE in this period, apart from the monastery of al-Khawr at Sir Bani Yas, and that, after the eighth century AD, seems to have been deserted or on the point of abandonment.

Put into a broader context, this evidence of Abbasid period settlement from Ra's al-Khaimah and other parts of the UAE corresponds to settlement activity all along the Gulf coast in the same period. The best known site archaeologically for the Early Islamic centuries is Siraf on the Iranian side of the Gulf, but excavations and surveys now show Abbasid-period sites to be widespread, being identified at Suhar and, as we have seen, in the UAE, at Murwab on the coast of Qatar, in Bahrain, at al-Qusur in Kuwait and at the well-recorded site of Susa in south-west Iran.

Throughout this period, al-Basra in southern Iraq was the main town of the northern Gulf, the Early Islamic site now marked by al-Zubayr. Cumulatively, this information begins to give archaeological form to the Gulf as the major waterway of the Abbasid period when Baghdad was the centre of the Caliphate. All of this should be seen in the context of conclusions by earlier scholars, who have suggested that the disorders in southern Iraq associated with the Zanj, and the power of the Qaramita (Carmatians) in al-Hasâ and Bahrain led to a decline in Gulf trade around 1000 AD, and the shift of commerce to the Red Sea and the new Fatimid state based at Cairo[5].

The Fourteenth Century AD to the Later Islamic Period

The entire complexion of the political framework of the Middle East was transformed with the vastly destructive Mongol invasions initiated by Genghiz Khan in the early thirteenth century AD. These invasions culminated in the sack of Baghdad in 1258 AD and the murder of the Abbasid Caliph, al-Mutaʿsim. The line of continuous successors to the Abbasid Caliphate was brought to an end for the first time since they had established their rule in 750 AD. In the aftermath of the Mongol invasions, a series of new regimes emerged, among them the Turkish Kara Katayans of Kirman in central Iran who dominated the south-east of Arabia from 1224 until 1364 AD. The local power henceforth was Hormuz which emerged after 1300 AD. The princes of Hormuz still ruled the lower Gulf when the Portuguese arrived on the scene in the later fifteenth century and thereafter they continued as a regional power in conjunction with the Portuguese until the Safavid Shah ʿAbbas brought their dominion to an end along with that of the Portuguese in 1622 AD. The coinage struck by the Hormuz princes at Jarun (Old Hormuz) was in circulation in considerable quantities at Julfar in the fourteenth to seventeenth century AD period. Understanding of this little studied coin sequence will eventually provide important knowledge about the rulers of the area (N. Lowick in Hansman 1985).

From the fourteenth century to the Late Islamic period and the eve of modern times, archaeological evidence abounds throughout the UAE. While sites all along the coasts and in the interior of the UAE bear witness (almost always based on ceramic evidence) to settlement in this period, it is at the excavated Islamic port site at Julfar in Ra's al-Khaimah that the Late Islamic period comes most clearly to light. Geomorphological studies and excavations have shown that the site now recognized as Julfar, the immediate predecessor of the city of Ra's al-Khaimah, dates from after the fourteenth century when a hut settlement was established on a sand bar which had only recently emerged from the sea.

The Julfar of the Early Islamic period appears to have shifted from its original site (wherever that was) to develop on this new location. It is hinted by al-Idrisi that by the twelfth century AD, sand-bars or siltation were affecting navigation in the Julfar area and it may be that the harbour of the earlier Julfar became un-navigable and it was found necessary to move to the new site. This new Julfar is that which is mentioned throughout the Portuguese period in the Gulf when the town enjoyed great prosperity as a regional trading entrepôt. Its connection with the Indian Ocean commercial network is reflected in the quantities of Chinese, Vietnamese and Thai ceramics recovered in excavation, along with Indian glass bangles and Iranian pottery.

The Julfar of this later period had a trading prominence which made it the equivalent of modern Dubai. Duarte Barbosa in 1517 AD describes the local merchants as being wholesale dealers, persons of worth and great navigators (Barbosa 1918/I: pp 73–74). When the Portuguese arrived, Julfar was under the jurisdiction of the ruler of Hormuz who benefited from its commerce and its pearling fleet (Dalboquerque 1875/I: p 246). In the early sixteenth century AD the Portuguese came to dominate the Indian Ocean trade with their string of forts from Hormuz to Goa, Malacca and Macao in China, and it is in this sixteenth to seventeenth century AD period that Julfar underwent a great expansion. The centre of the town was in the walled area known as al-Mataf but it extended north and south, to al-Nudud, towards Ra's al-Khaimah.

During this expansion, Julfar was transformed from a hut settlement to a town of much larger sand-brick houses. In the area excavated by the Japanese team of archaeologists working at the site, a grid-like pattern of streets was found running between the brick houses. In the central area of al-Mataf, a small sand-brick mosque of fourteenth or fifteenth century AD date underwent a series of reconstructions, presumably as increases in the Muslim congregation necessitated a larger area of worship. As a result, a sequence of five mosques were built one above the other, all on the same site with ever-increasing dimensions and dating from *ca* fourteenth century AD through to the sixteenth or seventeenth century AD. Near the mosque the British team excavated a large courtyard house which had continued in use over a considerable period of time, before the place declined and became once again the village of *ᶜarish* huts that it had probably been after the sand-bar first formed in the fourteenth century AD. It was as Julfar declined that Ra's al-Khaimah rose to prominence as the favoured centre of settlement.

The map of the coast of Arabia in the *Atlas* of Lazaro Luis, dated 1563 AD, shows a number of fortresses built by the Portuguese, including one at Julfar. A pronounced inlet is also marked, probably a silted creek which once formed the harbour. The silting of the harbour may account for the decline of this Late Islamic Julfar and the rise of its southern neighbour, the modern city of Ra's al-Khaimah, some time after the expulsion of the Portuguese by the local Arabs in the mid-seventeenth century AD. Ra's al-Khaimah is mentioned by Gasparo Balbi in *ca* 1580 AD, by the local Arab navigator, Ibn Majid, in the latter half of the fifteenth century AD and by Duarte Barbosa in 1617 AD.

By the eighteenth century AD, Ra's al-Khaimah was associated with the Al Qasimi sheikhs who still rule the emirate. The fortress of the town built by the Al Qasimi is now the National Museum of Ra's al-Khaimah. Sondages by J. Hansman suggested to him that the site of the fort had served as a camp during the military occupation of south-east Arabia by the Afsharid Turkmen ruler of Iran, Nadir Shah, between 1737 and 1749 AD. The fortress at Khatt, inland from Ra's al-Khaimah, also seems to have been used by Nadir Shah's forces.

Further north along the coast from Ra's al-Khaimah is the fortress at Dhayah, on the summit of a steep hill at the foot of the mountains, near to the harbour of Rams. Dhayah played a role along with Ra's al-Khaimah city in the fighting with the British expeditionary forces of 1809 and 1819. Inland, the Palace of Sheba (*Qasr* Zaᶜba) still functioned in the later Islamic period although, as previously seen, its origins are older.

Many Late Islamic towers occur throughout the UAE, the best recorded being those that once formed a defensive system around Ra's al-Khaimah (Waᶜdad and al-Kharkhur 1992; Kennet 1995). The tradition of tower construction in the Oman peninsula may be of great antiquity, with fortified towers, all of the third millennium BC, being recorded at Hili in Al Ain, at Bidiyah in Fujairah and Tell Abraq. The Early Islamic sources, as we have seen, also refer to fortifications at Tuwwam or Riyam (Al Ain/Al Buraimi). It is possible that changes in military technology and the use of artillery, first introduced to south-east Arabia by the Portuguese in the late fifteenth century AD, affected the evolution of UAE and Omani fortification traditions, with the artillery fortresses of the Portuguese having an impact on some local fortifications (d'Errico 1983: pp 291–306).

There are a number of extant later Islamic fortresses scattered around the UAE, including those at Fujairah, Umm al-Qaiwain, Ajman and Dubai, as well as that at Ra's al-Khaimah. In Abu Dhabi emirate there are also forts in Abu Dhabi city itself, and inland in the Liwa and

the Al Ain oases (el-Mutwalli 1997). Remains of a fortress have been excavated inland at Mantiqat al-Sirra by S. Garfi for ADIAS, near Madinat Zayed in the Western Region of Abu Dhabi emirate (Czastka and Hellyer 1994: pp 9–12). This fortress has been associated tentatively with the events of the year 1633 AD, when the leader of the Bani Hilal, Nasir b. Qatan, was joined by members of the Bani Yas at the fort of al-Dhafra 'on the confines of Oman'. It is possible that the fortress at Mantiqat al-Sirra is synonymous with the al-Dhafra fort. This episode is also interesting inasmuch as, taken with Balbi's reference of *ca* 1580 AD to the island of Sir Bani Yas (*Sirbeniast*), it provides an indication of the length of time that the Bani Yas rulers of Abu Dhabi have been present in the region.

Until recently, the fortifications of the Portuguese period in the UAE have been better recorded by early maps of individual fortresses around the south-east Arabian coast, than by archaeology. However, an Australian team has now excavated the fort of Bidiyah in Fujairah which is identified with 'Libedia', a Portuguese fortress recorded by de Resende in his 1646 AD map (de Resende, 1646; Ziolkowski 1999: pp 19–21). The walls of the Portuguese fortress of Bidiyah were largely built with masonry from a third millennium BC tower nearby. The Portuguese fortress measures 60 m a side and C14 analyses from the foundation levels confirm a date of 1450–1670 AD for the building, matching the date of ceramics retrieved during the excavations. These in turn are comparable to the ceramic sequence from Julfar and sites at Khashm Nadir, in Ra's al-Khaimah. While the Bidiyah building is identified as a Portuguese fortress, archaeological material remains reflecting Portuguese presence at the fortress site are limited. This contrasts with Portuguese sites elsewhere in the Indian Ocean, where there is more evidence of items imported by the Portuguese from Europe (Kirkman 1974: pp 119 ff and 297 ff).

Apart from fortifications, there is evidence all over the UAE of Late Islamic period settlement, often in areas where we have little or no archaeological material from Early Islamic times. This has provided a broader picture to counterbalance the importance that past archaeological studies have tended to give to Julfar and which has afforded such a wealth of information for the Late Islamic period. At Wadi Safad in Fujairah, fieldwork has shown its efflorescence in the Late Islamic period, a pattern which is probably typical of settlement in the valleys of the mountainous north of the UAE. Agriculture in Wadi Safad, which was sustained in the past by water tapped from springs in the mountainsides, used *falaj* systems that irrigated terraces and plantations, although many of these have now fallen out of use. In the mountains above Wadi Safad are numerous farms and many of these, too, are abandoned. Such farms occur all over the highlands of the Jebel Hajar. Dostal has recorded the stone-built architecture of similar mountain farmsteads in Ra's al-Khaimah (Dostal 1983), while Paolo Costa has described farms and their architecture further north in Ru'us al-Jibal in the northern enclave of the Sultanate of Oman (Costa 1991: pp 95–143). Such mountain farmsteads appear to be of Late Islamic date.

Not far to the north of Wadi Safad on the coast of Fujairah is the remarkable four domed mosque at Bidiyah whose design is unique in the UAE and which also belongs to the general framework of the later Islamic period. However, while other older mosques are known elsewhere in the UAE, at Julfar, al-Falayya, Jazirat al-Hamra' and Dalma, the mosque at Bidiyah belongs to a very different architectural tradition. Although it hints at mosques in Yemen, especially on the Red Sea coast, it is of a different character to them as well (al-ᶜAbudi 1992; Willems and Allaire 1994: pp 73–76). Other Late Islamic mosques are preserved in Ra's al-

Khaimah, and a group of mosques together with a pearl-merchant's house of the same later period is situated on the island of Dalma in Abu Dhabi emirate (King, at press). A very tentatively identified mosque, cautiously dated to the nineteenth century AD, was excavated at al-Hamriyah in the city of Sharjah by a French team of archaeologists (Mouton 1989: p 23).

In Sharjah and at Dubai in the Bastakia area, there still survive a number of traditional buildings which include several wind tower-houses (Coles and Jackson 1975; Rustamani, n.d.; Azzawi, n.d.). Dr M. Azzawi has restored a number of these later Islamic monuments in Sharjah and has published accounts of his work. Similar wind-tower buildings survive in Ra's al-Khaimah, and they once existed in Abu Dhabi. These are all related to a broader Gulf building tradition that is also encountered in Qatar, in Bahrain and on the Iranian side of the Gulf. The extant traditional buildings still scattered around the UAE and elsewhere in the Gulf have an archaeological significance in that they may well preserve the appearance in elevation of buildings only now surviving at archaeological sites in terms of wall footings, exposed in the course of excavations. These extant buildings therefore provide a level of guidance to understanding the character of the architecture of the UAE coasts in earlier periods.

Little archaeology has been possible in the rapidly developing modern cities of the UAE although a certain amount of work has taken place in Ra's al-Khaimah, Sharjah, Abu Dhabi and Dalma. D. Kennet undertook excavations of Late Islamic structures in the city of Ra's al-Khaimah, while at Sharghan in Sharjah city, opposite the Al Qasimi hospital, a large site was found which was assigned by the excavators to the nineteenth century (Mouton 1989: pp 23–25) and which is presumably related to Sharjah's pre-modern existence. In Abu Dhabi city, only the Al Nahyan family graveyard now preserves the original landscape of Abu Dhabi island before it was developed in modern times, with ceramics found on the surface that date from the Late Islamic period. In the course of restoration of the late mosques at Dalma by Dr Azzawi, the wall foundations of Late Islamic structures were exposed near the al-Muraykhi mosque.

The islands off the UAE coast provide numerous and persistent indications of settlement in the later Islamic period, some of which suggest transient and seasonal habitation, associated with pearling and fishing. Such sites are often marked by shell middens and sometimes scatters of typical Julfar horizon Late Islamic ceramics. The shell middens tend to consist of both pearl oysters and dietary shells and are frequently encountered on the more undisturbed islands, like the Yasats, Humr, Ufzaiyya, Ghagha', Marawah, al-Aryam (Bu Khushaisha) and Balghelam, while there used to be the remains of an old fishing village called ʿAwafi on Sir Bani Yas, which had large middens. Late Islamic finds on Abu'l-Abyadh, al-Rufayq and al-Qusabi and other islands all indicate activity in this later Islamic period, almost always associated with pearling and fishing. Similar types of sites were noted by Boucharlat along the coastline of Sharjah on the mainland (Boucharlat 1989: pp 32–33).

The numbers of Islamic graves give some indication of the population in the later Islamic period on islands that are now largely deserted. There is every reason to suppose that archaeological evidence of pearling and fishing activity, its extent masked by modern development, would have occurred on all the islands off the coast in the past.

On some islands, evidence of settlement more permanent than mere camps is found, in the form of small villages, the basis of whose economy would also have been fishing and

pearling. Their Late Islamic date is indicated by the usual Julfar horizon range of ceramics. Although many of these smaller villages have vanished with modernization, traces of some of them have been recorded in the course of archaeological survey. They include the Late Islamic village of Dalma on the southern shore of the island of the same name (the walls of which Azzawi exposed), the now-vanished villages of al-Thahir and ᶜAwafî on Sir Bani Yas, and Bu Karwa on al-Aryam. Surviving villages on Marawah include Ghubba and Liffa which appear to be the descendants of Late Islamic villages. As to the character of these island settlements, it seems that many of their structures consisted of ᶜ*arîsh* reed huts and stockades like those that appear in old photographs of the UAE towns before the modernization of the country in recent decades.

While most of the island sites are from the later Islamic period, evidence of *ca* fourteenth century AD activity has been found at Dalma, al-Rufayq and Sir Bani Yas. At Sir Bani Yas and Dalma such dating is suggested by the presence of Far Eastern ceramics including celadons in addition to the blue and white porcelains of sixteenth to seventeenth century AD date.

Stone outline mosques and water catchment systems are encountered on some of the islands off the coast of Abu Dhabi. The mosques are of a simple type found all over the Arabian Peninsula and desert areas of the Middle East. Those on the Abu Dhabi islands vary between a simple outline of single stones serving as a place of prayer for a small number of individuals, perhaps no more than one or two, and those for a larger congregation.

The water deflectors exploiting the topography of the limestone surface formations to store water are structures that characterize many of the islands. Places where rainwater tends to gather are often amended by these man-made water deflectors which direct the water to places where it can pool during the wet seasons. These water catchments are usually found without any dating material, but their prevalence and their association with other features such as stone-outlined mosques suggests that some, at least, should be linked to the Late Islamic period.

A unique coastal site associated with the later Islamic period is located at Jebel Dhanna, in the Western Region of Abu Dhabi. Jebel Dhanna is a diapiric salt dome, one of several in the region, and it has very pure sulphur deposits. Sulphur was traditionally used for curing camels of diseases and for general medicinal purposes, but although exploitation of the sulphur may be ancient, until the coming of the Portuguese its use would have been limited. After their arrival and the introduction of guns and artillery, however, sulphur was demanded in quantity for the manufacture of gun-powder. With its large-scale sulphur deposits, Jebel Dhanna underwent extensive mining from *ca* sixteenth century AD onwards, leaving numerous pits and trenching along with Late Islamic pottery and occasional pieces of pure yellow sulphur scattered all over the mountain.

In contrast to the coast and islands, a very different environment is represented by the desert which characterizes much of the interior of the UAE, especially Abu Dhabi. This desert constitutes the eastern edge of the vast Empty Quarter sand-sea that covers much of the southern half of the Arabian Peninsula. Since pre-Islamic times, the desert has been a landscape of nomadic camel herders, camping near the limited number of water sources, usually around the perimeters of the deep desert. Archaeological scatters in the sands, in all periods, are very limited, usually reflecting the accidental loss of a lithic tool kit or the loss or breakage of a few ceramic vessels. These finds are mostly discovered on the interdunal gravel plains, the palaeofloors that represent the desert surface before the sands of the Empty

Quarter overwhelmed this earlier gravel surface. In rare cases, at Sahil, for instance, north of Liwa, and at Tawi Baduwa Shwayba, there are denser scatters of Late Islamic pottery and other ceramic sites of this character may exist. They presumably mark litter from nomadic campsites, but they also reflect the range of ceramics that penetrated these interior desert regions in the later Islamic period.

[1] Abu Dhabi Islands Archaeological Survey (ADIAS) was established in 1992 on the instructions of HH President Sheikh Zayed b. Sultan Al Nahyan under the patronage of HH Lieut-General Sheikh Muhammad b. Zayed Al Nahyan.

[2] The Arab geographers use the broad geographical term ᶜUman to describe the territory encompassed by the UAE and the Sultanate of Oman.

[3] Al-Dur was the subject of excavation by a series of international expeditions, and is best summarised by D.T. Potts, *The Arabian Gulf in Antiquity*, Oxford (1992), ii.,'. . . By the fourth century AD it seems to have fallen out of use'. Dr Peter McGee is currently excavating this Iron Age site, a walled town of remarkable extent. The site of al-Milayha appears not to have remained settled beyond the fourth century AD (M. Mouton, *La Peninsule d'Oman de la fin de l'age du fer au debut de la periode sassanide (250av.–350 ap.JC)*. unpublished doctoral thesis, Universite de Paris (1992).

[4] To this list of Nestorian churches should be added a possible church at Siraf on the Iranian coast. The building concerned is basilical and is now dated to the ninth century. AD, but although the excavators thought it could be a church, they express great caution about this (Whitehouse, 1974, pp 21–23).

[5] For a discussion of this premise of a shift of commerce from the Gulf to the Red Sea, see B. Lewis, 'The Fatimids and the Route to India', *Revue de la Faculté de Sciences Economiques d'Istanbul* (1953); see also C. Cahen, 'Buwayhids or Buyids', *Encyclopaedia of Islam* (new ed.).

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The Tribal Society of the UAE and its Traditional Economy

Frauke Heard-Bey

Introduction

Hundreds of millions of years ago a source of wealth was trapped several thousand metres under the territory of the UAE. Before this oil and gas was discovered and exploited, there was precious little to be found on the surface which could be called 'natural wealth'. Yet, the scant resources were sufficient to sustain the inhabitants of this area throughout the centuries. They had developed the means to make all aspects of their seemingly inhospitable environment work for them. Management of these economic resources was harmonized with an age-old social structure producing unique socio-economic responses to the rigours of life in the eastern corner of the Arabian Peninsula.

The local population of the present day UAE is tribal in origin. Does that mean that every person in the UAE who wears a white *thob* is descended from the bedouin of the Arabian desert and would once have lived as a nomad? What does the word 'tribal' encompass? To shed some light on such questions and to be able to understand why these concepts are central to the structure of the traditional society of the UAE, it is necessary to know how this society supported itself economically in the past.

The Tribe as Society's Genealogical Building Block

Most national householders can quote a tribal name, which forms rightfully part of his own name. This name could be a generic name *(nisbah)* such as 'Ameri (plural 'Awamir) used as the last part of a name after his father's name and possibly his paternal grandfather's (e.g. Muhammad bin [=son of] Khalifah bin Muhammad Al 'Ameri). It could also be the name of a forebear of countless generations back, who is considered the 'patron' or eponym of the many groups of families, which see themselves as his offspring.[1] Such a tribal name is Al Rashidi or Bani Yas or Ahl 'Ali (family of 'Ali). A link can be established with the two famous ancestors of all the tribes of Arabia, Qahtan or Adnan[2], through this *jadd*, whose historical existence need not always be verifiable with chronological precision. Thus, a person's individual existence is embedded in his group, which is committed to him because of their common descent. The members of this group of common descent have a corporate responsibility to

provide support and protection. In practical terms a tribe is often too widely dispersed to be able to rally around one individual except in cases of general warfare, which might in earlier times even have been the result of one man's action leading to a blood feud.

Within the fold of the tribe, the individual head of the family (himself, wife and children) is traditionally bound by inescapable obligations of mutual assistance and a concept of joined honour to his immediate blood relatives – father, brothers, paternal uncles, cousins. Part of this particular relationship is the strong preference for marriages between the son and his paternal uncle's daughter (*bint 'amm)*. If this arrangement cannot be made because of age difference or for other reasons, marriage with a first cousin on the mother's side, or with a more distant cousin, is the norm in this society. Marriage outside the extended family is the exception, but does also occur, such as between families who are neighbours, or as a political move, as when a sheikh marries the daughter of another tribal leader.

A woman's place is clearly defined in this society. On marriage she keeps her father's name and remains emotionally most closely attached to her own family, to which she can return in case of a divorce. The bride moves into the house of her husband's family, where separate accommodation is prepared for the young couple and, if at all possible, for the families of all the other sons. Because her own family is losing a worker, the groom must give compensation to that family in money or kind. At the time of the marriage contract he also has to give the bride the means to support herself in case he were to divorce her later. This *mahr* remains her own property and is managed separately from the rest of the household.

The woman's role in the traditional economy was pivotal because, as will be seen later, the need to alternate between various economic activities placed great responsibilities on the women during the long periods of time that men were obliged to be away from home. Her contribution earned her a high status in society, and a husband's reputation and honour rested on the conduct of his wife and daughters. Although it was permissible to have more than one wife, in practice few men could afford more than the one household; but because many women died in childbirth, it was not uncommon for a man to have several wives in succession.

It may be noticed that not every man uses the name of his tribe *(nisbah*) as the last part of his name (e.g. Al Mansuri, Al Dhahiri, Al Za'abi). Considering the size of some of the tribes, this could lead to confusion, even if everyone were to include his grandfather's name. Many of the last names of local families in the UAE today are derived from one of the several possible sub-divisions of the tribe (*qabilah)*. These horizontal divisions are kinship groups (*'ayal* [3]) and the sub-tribes (*fakhdh* pl. *afkhadh)*, which are likewise perceived in genealogical terms. In the graphical rendering of the tree-like relationship between a man and his tribal eponym, these divisions figure as the extension of the extended family.[4] Thus, many members of the Bani Yas tribe of Abu Dhabi and Dubai have family names like Al Mazrui, Al Qubaisi or Al Hamili, referring to the sub-tribe to which they belong.

The Political Aspect of Tribal Cohesion

The boundaries between tribe and sub-tribe are not clear for several reasons. A tribe could be a confederation of tribes which have decided, for political or economic reasons, to follow the leadership of one of the constituent tribes' sheikhs, as is the case with the Bani Yas, where

Yas figures as a common eponym to signify the tribal cohesion. There could also be an alliance between two tribes to form one. In other cases a sub-tribe may assert itself over time or become remote from the main tribe, and its members may eventually adopt the name of the subdivision as their tribal name – as is now the case with the Al Bu Shamis, whose relationship with the Na'im[5] is well known in local understanding, but who were nevertheless listed separately in the population census of Abu Dhabi of 1968. Whether a group deems it more useful to be identified as the smallest unit (*fakhdh)* which often also lives together in the same locality, or as part of a bigger unit, may also vary from one community to another, and from one political situation to another.[6] Individuals may have different views on the matter, depending on their current status and, if questioned, on the view of the inquirer. The relationship of tribes and their constituent parts is not static – it has always been the result of regional politics and remains a matter of tribal dynamics.

The Population of the Trucial States

Therefore neither the names and numbers of the tribes which make up the local society, nor their sizes, can be stated with precision. Considering the above mentioned tribal dynamics, assessments of numbers are bound to vary over time. The first such statements with regard to the whole country, which was then called the Trucial States,[7] were possible after a concerted effort was made by J.G. Lorimer, the author of an official publication on behalf of the government of India. During a visit to Sharjah in 1904 he collected detailed information and also enlisted the help of other government officials, who undertook several journeys to supplement these findings.[8] At this time 44 tribes were listed, with some having main subdivisions and a number of further subsections. Lorimer remarks that 'indeed, the country is tribally one of the most composite and perplexing'.[9] The word 'country' is used here as a geographical term; the government of India considered each emirate as a separate political entity, headed by a ruler who attracted or commanded the loyalty of some or many of these tribes or tribal sections.

The political affiliations of these 44 tribes were listed by Lorimer as being divided between only five 'principalities', whose territorial extent is, however, approximately that of the UAE of today. The tribes comprised an estimated 80,000 people.[10] One tenth of them were then considered bedouin and would not necessarily have spent all the year within the territory of the Trucial States. The Bani Qitab and the Bani Yas had the largest bedouin contingent; their way of life will be discussed later. In 1968 the Trucial States Council organized the first population census for Dubai and the five northern emirates, and in Abu Dhabi the Department of Planning carried out a census simultaneously. The population of Dubai had reached 58,971, the five northern emirates were together 74,880, and that of Abu Dhabi was 46,375.[11] The number of people who gave the information that they belonged to one of the local tribes was 44,668 for the five northern emirates and 17,750 for Abu Dhabi.[12] In Abu Dhabi a further 2600 were listed as nationals, but were not reported to belong to any particular tribe; they are most likely the descendants of people who came into the Trucial States at the height of the pearling industry's boom. There seemed to have developed a fragmentation among the tribes as well as a greater awareness of a tribesman's own place in his society, because by 1968 the number of separately listed tribes reached 67. Compared to the first decade of this century all the

additional names are, however, not new names, but those which figured as names of sub-tribes in the past. For the people of this region – settled or bedouin – the tribe is the principal building block for the structure of their society. For the individual, this tribal 'belonging' is far more reassuring than the comforts of 'home' and the sense of security, which is paramount for people whose social structures are associated with the land they live on.

Origins of the Arab Tribes and their Dispersal throughout the Region

The ancestors of this tribal population have not always lived in the region. They took possession of this land during successive waves of population movement, which brought Arab tribes from Yemen by way of Oman as well as by way of central and northern Arabia. They would have found people already settled in the economically viable locations[13] and there were probably some nomadic groups here as well, combining herding, hunting and fishing. The descendants of this original population were probably absorbed, although some were for a long time identifiable as separate communities, particularly in the mountains of Oman. Coming from the tribally structured, highly organized culture of Yemen, where a sophisticated edifice such as the Marib dam was built and maintained, the new arrivals retained their tribal structures and their community-building genealogies and legends. Thus they also retained their strong kinship ties with the people elsewhere on the Arabian Peninsula, and their sense of belonging to the Arab *ummah.* That sense of nationhood could be maintained throughout such a vast and inhospitable region because they all shared Arabic as their common language – a language which was to become the language of their common religion.

Although there is evidence of linguistic links between northern Oman and the UAE and the Old South Arabian culture going back at least to the middle of the first millennium BC, larger numbers of Arab tribal groups started to arrive here in successive waves only since the second century AD. They moved to areas such as Taw'am (Tuwwam), the old name for the twin oases of Al Ain and Al Buraimi, and to other areas in the mountains, the mountain foreland and Inner Oman, where people had lived since at least the sixth millennium BC.[14] Those who came later had to find other opportunities to make their living in the less well-watered parts of the country, which required them to adapt to a more rigorous environment. Over time there developed a great diversity of economic pursuits, while the unity in the social structure was retained, both of which were the hallmark of the traditional society of the UAE. The result of a long process of adaptation to the rigours of a land with limited resources can be seen in the traditional economy of the country, an economy which entered a new phase only 40 years ago.

Life in the Sandy Desert

A tribe's quest for water

The general climatic conditions of the UAE are much the same throughout, with summer temperatures reaching close to 50°C and unpredictable, localized rains mostly in winter. The landscape of the UAE varies considerably and so, therefore, does the usage which people have learnt to make of what the land can offer them. The availability of water dictates this

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Aerial view of the ruler of Abu Dhabi's Palace (March 1962).

usage and has been the key to the economic life and to much of the social structure of this country's past. The country can be broadly divided into three geographically, and therefore economically, different regions: firstly, the coasts and islands, secondly, the Hajar mountain range with its valleys (wadis) and adjacent gravel plains and, thirdly, the sandy desert.

On the face of it, the desert seems to offer the least resources. How could people live there throughout the year, finding enough water to drink during the summer months? Yet the largest tribe of the UAE, the Bani Yas, has for several centuries inhabited the vast spaces of aeolian sands which cover most of the country's territory, and almost all of the emirates of Abu Dhabi and Dubai.[15] Other tribes, too, such as the Awamir, Manasir and others, have shared this challenging habitat for countless generations. The sandy desert begins behind a stretch of coastal salt flats, called *sabkha*, with little white dune ripples rising as one goes south – eventually forming large orange-red dunes. Within this vast desert, which stretches to beyond Abu Dhabi's southern border, some of the highest dunes in all of the Empty Quarter are found, about 100 km distant from the coast. Some tower up to 200 m above the desert floor, catching some of the precipitation, fog and dew, which, although often heavy at the coast, diminishes considerably further inland in the desert.

In the distant past the ancestors of the bedouin, who made this region their home, discovered that they could find water in the dunes, which was adequately plentiful and often also relatively

sweet. In many of the hollows between the dunes they created date gardens and built themselves houses using the branches of the date palms, eventually forming about 40 settlements,[16] some of which were inhabited all the year round. This half moon arc of villages called Liwa, spanning about 70 km from east to west, has been the centre for the economic and social life of the Bani Yas at least since the sixteenth century.[17] A varying number of subsections[18] have acknowledged the leadership of the sheikh of one particular subtribe – the Al Bu Falah – for at least ten recorded generations. Under their leadership their undisputed grazing area, their *dar*, included the Liwa, the intervening territory between it and the coast, called Al Dhafrah, the area called Khatam stretching eastwards as far as the foreland of the Hajar Mountains and, in the west, the land known as Baynuna and the Sabkha Matti and the area up to the Qatar peninsula.[19] Other tribes' participation in the grazing was usually acceptable on the basis of mutuality.

During the summer months many tribes retreated from the sandy desert to the savannah-like outwash plains at the foot of the mountains, whereas the Bani Yas and their associates adapted to the rigorous desert environment and made it their home. The patterns of their economic exploitation varied over time, but all the subtribes and clans were accustomed to wander great distances over long periods of time with their camels in search of grazing, moving as entire family units, seeking the precious gifts which the desert had to offer for those who knew how to make use of them. Almost all Bani Yas families, with the exception of fishing groups like the Al Rumaithat, returned to a home in one of the Liwa settlements at certain times of the year.

The thicker the sand cover or the higher the dunes, the better the chance there is of finding a good source of water. The seasonal rainfall and quite frequent heavy dew rapidly sinks into the absorbing sand, which also acts as insulation against evaporation. The water which is thus trapped in the dunes frequently does not escape downwards, because there is a fairly level, impermeable rock formation below the dunes and the intervening depressions. However, the water which rains down on the sand and is collected in shallow wells at the bottom of high dunes is not potable everywhere in this desert. Depending on the composition of the sand, the water may dissolve chemicals during its passage through the dune and then be too brackish for human consumption. It may even be unusable for animals or plants.[20] The inhabitants of the Liwa developed the knowledge of where best to dig for good water and often did not have to go down much more than 3 m to find some. Out in the sands some wells have been established for centuries, and the right to draw water from one of those has been of the greatest significance in tribal politics.

The date palm – a wonder of the desert

Wherever it is found and whatever its quality, the water in the sandy desert never flows and extensive agriculture could not be developed there. But one tree, which combines many wonderful properties, is ideally suited to grow even at the foot of a huge sand dune in the middle of the desert: *Phoenix dactylifera*, the date palm. It can tolerate very high salinity and thrives even in intense heat.[21] As a cultivated fruit tree, the date palm is not propagated from the date stone, but from side shoots which grow at the foot of a mature tree. These are separated and planted when they are already 100–150 cm high and have a good nest of roots. The newly-planted saplings need to be watered regularly. In the desert the water is carried from the well – one leather bagful at a time. After months, or even years, the young bushy plant's roots will reach the water table and be self-sufficient. However, its rate of growth and eventual yield of

dates is significantly influenced by the amount and quality of the water available.[22] Care for the date tree does not end when watering by hand ceases. The bushy plant grows branches at ground level and thereby increases its volume; eventually the outer branches are trimmed and every year as it grows these branches are cut higher up, and thus eventually the trunk is formed. The stumpy ends of the cut-off branches serve as footholds for the cultivator when he needs to climb into the crown of the tree. After three or more years, depending on the amount of available water, the tree begins to flower in spring; then the caretaker must be there to pollinate with the panicles from a male tree, of which only very few are planted. He has to climb every tree and carefully distribute the pollen to all the little waxen flowers. The harvest of the dates takes place during the hottest period of the year, between late June and early October, depending on the type of date tree. The harvest involves climbing the tree and cutting the heavy bunches, which are either carried down or thrown to helpers below.

In this country people like to eat dates fresh when only half the fruit is soft and brown. The harvested dates were essential for the survival of the inhabitants in the desert. The ripe dates are lightly boiled and compressed into a congealed substance called *tamr* which can be kept almost indefinitely, because the high sugar content kills germs which might settle on it. The dried palm fronds are plaited into containers, in which the nourishing, vitamin-rich staple diet can be taken on journeys through the desert, into the mountains, or out to sea. The date tree, which grows so well in the desert where water is available, is like an anchor for the existence of the Arabs in this environment. The yield from the small palm groves which were established in the sandy desert was, however, insufficient for entire families to live off throughout the year.

The camel – God's gift to the bedouin

The bedouin like to say that God has been fair because He gave them the ideal tree for their desert, but that He has shown His bounty by giving them the camel as well. This animal is not only as superbly suited to the desert environment as the date palm, but it also provides for almost all the further needs of its owner. The camel gives the local tribesman his mobility. The camel is his mount as well as his beast of burden. He can ride it to war, to his date garden, to a distant market, to a port – or for fun, such as in the traditional races. He can load his camels and take them in a caravan across terrain where no other transport could pass. Often camel milk and the products derived from it were almost the only source of protein for the entire family for months on end; then one day there would be a feast to celebrate a wedding or the arrival of a guest and a he-camel would be slaughtered to provide the meat. Camel hide was used to make bags and other useful utensils, while some of the finest mens' outer garments (*bisht*) were woven from the hair.

The camels bred in the desert of Eastern Arabia were renowned for their endurance and speed. Throughout generations, to sell or barter them was the principal means of obtaining goods, which could not otherwise be obtained from within the extended clan. The possession of camels constituted great wealth and caring for them had a high priority. In the winter their owners or caretakers would wander for weeks in an area where sufficient rain had made the dormant vegetation of the desert sprout. If there was no water well nearby, the milk from the camels was enough for the people to drink. When the camels have good grazing, they do not need any water themselves in the winter.[23] But in the heat of the summer, when the grazing is dry, the camels are kept close to a well and they return daily by themselves. Each camel

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Hunting falcon outside the ruler of Abu Dhabi's palace, 1954.

requires about 40–50 litres of water, which meant hauling maybe more than ten leather bags of water up from the well and emptying them into the *hawd,* a leather trough slung over a wooden frame. The camel owners were fortunate if there was enough summer grazing close to where they owned date trees, because in this way they could participate in the harvest and make use of the water wells which supplied the communities occupying their palm frond homes (known as *'arishah* or *khaimh)* in the Liwa.

Life on the Coast of the Gulf

Fishing

The territory, which had over time become the exclusive *dar* of the Bani Yas tribes, is bordered by 600 km of coast. As can be expected, the inhabitants of the hinterland made every possible use of the resources which this area of beaches, sand banks, creeks and inshore islands offered. They also colonized the many more distant islands. The extensive tidal shallows, which are characteristic of most of this coast, are ideal for fishing with traps. These were intricately constructed fences, placed to shape a letter V, where the fish were caught when the water receded. Another method involved stretching two nets at right angles to the tidal creek from

a central pole; the use of a small dugout and working in a team of two or three fishermen was essential in some locations. But there were also methods by which one man alone could secure a good catch as, for instance, by stalking a shoal of small fish in the shallow water and casting over it a circular net weighted with stones.[24] Fish which was not consumed fresh was hung up in the sun to dry, or treated with salt, and taken to the inland settlements where this additional protein was very welcome. Some of the small fish was dried and used as camel fodder or as fertilizer for the gardens, but, as for the fresh fish, the fishermen on the coast of Abu Dhabi were a long way from markets. There is archaeological evidence that on most of Abu Dhabi's numerous islands, tribespeople came to fish in the winter and even brought their camels over in boats. They used rainwater, stored in cisterns, or caught in horizontally placed sails. But the coast between Dubai and Khaur al-Odaid, at the foot of the Qatar peninsula, was not suitable for the establishment of larger, permanent settlements, because of the lack of reliable supplies of drinking water.

This was to change dramatically after the end of the eighteenth century, when it was discovered that a dune belt at the northern end of Abu Dhabi island yielded some fresh water, (which, being lighter, floats in lenses above the salty water table). The water was drawn from shallow wells, which, when brackish water intruded, were abandoned and new ones were dug. In around 1760, several of the Bani Yas tribal groups built themselves palm frond houses on the island near its northern shore. By the early 1790s, the town of Abu Dhabi had already become so important a centre of activity that the political leader of all the Bani Yas groups transferred his residence there from the Liwa. After 1793, Sheikh Shakhbut constructed the fort, which still stands today near the centre of the city. Soon, the supply of such limited amounts of sweet water did not suffice for the rapidly growing population; additional drinking water was brought in bitumen-lined containers by boat from Dubai, Ra's al-Khaimah or even Dalma Island.

Pearling

The reason for this increase in the population of Abu Dhabi was a resource which had played a role for the Arabs of this area since antiquity: the *lulu* (locally called *qamashah*), the pearl. These timeless items of adornment, which grow inside some of the local oysters,[25] have probably always been collected by wading fishermen, who would have kept their finds until an opportunity arose to barter them. The oysters accumulate in larger quantities on oyster beds (*fasht*) in water about 30–40 m deep, off the Arab shores of the Gulf. To bring enough of them up to make a living from selling the pearls and mother-of-pearl required a big communal effort, as well as sea-going vessels and people who could dive that deep. When, during the eighteenth and nineteenth centuries, the market for pearls grew rapidly in prospering India, pearling became an ever more important industry for the inhabitants of the Arabian coast and the hinterland.

By the turn of the twentieth century about 1200 boats were based in ports on the Trucial Coast, manned by some 22,000 men, mostly tribesmen, but with extra hands brought in from Baluchistan and elsewhere to augment the work force. The pearling industry had transformed the traditional economy of the tribal population. Many families moved to live permanently in one of the coastal settlements, increasing, in particular, the size and importance of Abu Dhabi and Dubai.[26] Sharjah, Ra's al-Khaimah and the intervening coastal villages were already long-established as ports of the tribal Arabs and they, too, participated in this industry.

During its modest beginnings, pearling constituted just another means of exploiting all the resources available to the tribal people. They cared for their camels and tended the date palms – often in locations which were many days' travelling apart – and then, as pearling flourished, an increasing number of the able-bodied men participated in the dive *(ghaus)* during four months in the summer. Many of the Liwa-based sub-tribes of the Bani Yas formed co-operatives, which jointly owned a boat[27] and shared the proceeds of the sale of the pearls according to an established arrangement, giving the biggest share to the captain, a larger share to the divers than the haulers and leaving some money aside to finance the preparations for the following year. It was due to pearling that, over several generations, some tribes became more specialized in one economic activity or another and became tied to particular locations. Thus, the Rumaithat and the Qubaisat favoured the maritime activities and became attached to the coastal settlements and the islands, eventually giving up many of the date gardens they had in the Liwa. Other tribal groups such as the Mazari' remained dedicated to the desert. The Manasir went pearling, but did not own any boats.

Social changes due to the pearling boom

Towards the end of the nineteenth century, the pearling industry became increasingly the domain of individual entrepreneurs in the now flourishing ports throughout the Gulf. Some of the merchants, who were involved in the trade in pearls or imported consumer goods from India, accumulated enough capital to buy a boat, for which the wood had to be imported too, and to equip it with provisions for the 120 days of the diving season. In good years, the owner of a boat made a handsome profit by selling the pearls directly or through a local merchant (*tajir)* to one of the Indian traders, who came seasonally from Bombay, chiefly to Bahrain or Dubai. But storms, epidemics or other adversities could mean that the season's proceeds were insufficient to finance the next season and the owner would, in such circumstances, be forced to take an advance on the next year's catch. Because neither the captain (*nakhudah)* nor the rest of the crew were paid a salary, but instead obtained an agreed share of the profit, a bad year could spell disaster for years to come for all those who were locked into a system of financial interdependence. The divers were particularly vulnerable. They were no longer part of the multi-faceted tribal economy, but had settled in ports and lived from the money they earned during the third of the year they worked on a pearling boat. They needed advances from the captain to pay for their families' upkeep during their absence at sea. If the season's income was not as much as the advance, the debt was carried over into the next year and thus the diver became compelled to work for a particular captain year after year. [28]

Life in the Oases

The cash (resulting almost exclusively from the pearling industry) which flowed ever more freely into the Trucial States, had a great impact on the entire society, and also brought important changes to the hinterland. For the bedouin family, who had managed to wrest from the sandy desert the means to survive, a date garden watered by a flowing stream was the height of luxury. Thus, when individual families had accumulated surplus wealth, they turned

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Water running through the irrigation channels of a luxuriant oasis where date palms and associated plants flourish.

their attention to the villages in the Al Ain area, the nearest oasis, where several *aflaj*[29] brought underground water from springs near the mountains to the fertile soil in the plain. This oasis is already mentioned by the name of Taw'am in the early days of Islam, and prehistoric finds from the area point to it having been a centre of settled civilization for at least five thousand years.

In the nineteenth century many of the Bani Yas bought date gardens in this area, and members of the ruling family also established new date gardens and associated settlements there. There was a resident labour force of descendants of earlier inhabitants which did not belong to the tribal society, the *bidar*; they were accustomed to look after the gardens of absentee landlords and bedouin owners for reward in kind. The tribal population, which had lived in and around the oasis for generations, resisted the inroads of the Bani Yas. Eventually,

however, the dominant tribe of Dhawahir and some of the Shawamis preferred an amicable coexistence with, and the benefits of political protection by, the powerful Al Bu Falah leaders of the Bani Yas, who were much closer to home as compared to the distant overlordship of the Sultan of Muscat and Oman.

The availability of water made the nine villages of the Al Ain and Al Buraimi area a very desirable place. The economy of all such oases in the region differs a great deal from that of the sandy desert. The Hajar Mountains, which run from the Musandam peninsula in the north at the entrance to the Gulf through the UAE and Oman, form the spine of the land dividing the eastern coast areas from the desert region in the west. These mountains rise to just over 1000 m in the UAE, but reach 2000 m near the Straits of Hormuz and 3000 m in the Jebel Akhdhar region of Oman. Although the mountains consist of barren, friable rock devoid of topsoil, in the valleys (wadis) and the outwash plains on either side, fertile soil can be found in many places. The unpredictable, in some years prolific, winter rains run off the rocks quickly, but much of the water collects in the thick layers of gravel in the wadi beds and the plains.

The communal effort which is required to put these aquifers to good use is the hallmark of the tribes which live in and near the mountains.[30]

The most efficient system is the *falaj* (pl. *aflaj)*, initially a tunnel reaching for several miles to where the ground water table is higher than the gardens to be watered. Between the source and the gardens there are vertical shafts at regular intervals, which were needed during the time of construction and still now serve during maintenance for bringing out the spoil and admitting air to the people working in the tunnel. There is usually a village near where the *falaj* comes out of the tunnel to form an open stream. This is where the drinking water is collected by the women; downstream is the off-take for watering the camels and, below that, the communal bathing houses – one for the men and one for the women with steps down into the running water. Further down the stream again, there is a set of sluices to divert the water into various channels leading to the different gardens. Thus every date garden can get a meticulously measured time of water delivered by rivulets. A supervisor or *arif* is paid by the community to give every garden owner his allotted or acquired share; he keeps time by the stars at night and by a sundial on the ground by day. In these favourable conditions other trees besides palms can grow, such as figs, mangoes, oranges, pomegranates, grapes, bananas and, in particular, limes. Lucerne for animal fodder and a limited variety of vegetables, mostly sweet potatoes and onions, are grown inside these walled palm groves. Wheat, barley and millet are grown outside on land watered by the winter rains. Usually there are also wells in these oases to facilitate the drawing of drinking water near the houses, or to supplement the *falaj* waters in the gardens.

A *falaj* always serves many date gardens and is the focal utility for an entire village or tribal settlement area. The oldest *aflaj* in this region have been dated to around 1000 BC. Possessing a *falaj* signifies a dominant role for a tribe in the social web. However, most *falaj*-irrigated oases are a melting pot for different sedentary tribal communities, of which some have older rights or more property and therefore keep the upper hand in local politics. In addition to the tribal sections, each having their sheikh, the administration of such an economically important place was often entrusted to a *wali*, the representative of the distant ruler. The bedouin of the region, often being absentee landlords, also greatly influenced life in an oasis, because they could provide the fighting force in the event of a conflict.

Life in the Mountains

The important oases, such as Masafi, or Manamah, are situated away from the confining wadi walls, where good soil on level ground lends itself to agriculture. While they were usually shared between more than one tribe, there are countless small villages and hamlets in the wadis, which belong most frequently to just one clan or even a single family. There are *falaj*-like watercourses in use, which serve these smaller communities tucked away in the wadis. Some are even constructed by just one family for a terraced garden in the mountains: the wadi is dammed where surface water can be expected to run at least occasionally. The water is channelled into an open runnel called *ghayl*, which follows the wadi at a gentle gradient – in places forming a gallery above the valley floor – until it arrives at the terraced field or date garden. Terracing was known in these mountains since prehistoric times and this technique of increasing the potential for agriculture played an important role for these small tribal communities. They built retaining stone walls and levelled the ground above with topsoil to form small fields, which could be sown before the rains, or when the *ghayl* was prolific enough. The owners did not necessarily always live nearby, but visited several such favourable locations to see to whatever needed to be done, hoping for a reasonable crop from at least some of these terraces. A home – or, in times of strife, a hideout – could be constructed fairly easily with walls of wadi stones and a roof of palm fronds or brushwood. Choosing which of these temporary abodes to use at any one time depended largely on the additional economic activity which played a role for a tribe of the mountain regions: the herding of sheep and goats. The wadi beds and plains, and even the hills themselves, offer plenty of forage for these animals during the cooler part of the year.

Domestic animals, sheep, goats and some cows, were kept by the villagers mostly for their milk; donkeys were their preferred beast of burden, but camels and bulls were also kept nearby to help with drawing water. These animals did not need to be taken out for grazing, but were hand-fed with fodder grown in the gardens or, after rains had brought the vegetation to life again, with grass and herbs which the women collected daily. Some of the mountain tribal people, called *shawawi*, were semi-nomadic pastoralists, forming part of a village community, but wandering in the mountain region with their herds of sheep and goats. They also offered their services to transport goods on their donkeys or, more rarely, on camels through the mountains.

Life on the East Coast

On the eastern flank of the Hajar Mountains the plain along the Indian Ocean is only a few kilometres wide and, in its northern part near the town of Dibba, some mountain spurs reach all the way to the sea. The communities which live on this coast have the opportunity to combine, within easy distance from their settlements, all the different resources of their environment: fishing, oasis agriculture and husbandry. The most profitable type of fish was traditionally the anchovy (*bariya)*. Side by side with modern craft, wooden boats with a straight stern manned by about 20 people are still used to place a weighted net of about 100 m length

parallel to the beach. After several hours the ends of the net are pulled to the shore and the contents spread on the beach. The dried catch is sold locally and abroad as fertilizer. For large fish such as tuna or shark heavier tangle nets are now used, as well as handlines.[31] The meat is either eaten fresh or salted and dried on wooden racks. Sharks' fins are sold to merchants, who export them to China. Individual fishermen used (and still use today) the local craft, which is typical for the entire eastern coast including the Batina in Oman. This boat, the *shashah*, is made entirely of palm sticks and filled with the buoyant cut-off lower ends of the palm branches. The boatman is partly submerged, but he paddles the boat skillfully through the surf to lay out his net or line.

The villages along this coast, which until the middle of the twentieth century were under the distant rule of Sharjah, and many of which now belong to the emirate of Fujairah, have always been able to water their extensive date gardens from wells. The run-off water from the mountains sinks into deep layers of gravel before it reaches the sea. Once underground, this extensive wedge of ground water meets the saltwater, but does not mix. Sweet water is thus forced near to the surface at the beach, making it possible to plant date trees close to the sea. When they are mature they reach the brackish water table. Further back from the beach more date gardens were established with the help of many neighbouring water wells, some of which were operated by bulls lifting the waterbags with the help of a scaffold-mounted wheel. As in the *falaj*-irrigated oases, other fruit trees and some vegetables were also produced under these favourable conditions.

The Advantageous Combination of Resources in Ra's al-Khaimah

The hydrological conditions which obtain on the East Coast, are also found on the Ra's al-Khaimah coast between the western slopes of the mountains and the Gulf. There, too, extensive date cultivation and agriculture were traditionally combined with fishing; but while only a few people from the East Coast journeyed to Sharjah or Dubai to join the pearling season in the summer, the pearling industry played a bigger role for people in and near Ra's al-Khaimah, even though the main pearl banks are located offshore from Abu Dhabi and Dubai.[32]

Ra's al-Khaimah in particular, but also some other settlements along the coast to the south-west, have been favourably located for trade with distant countries. The ports of medieval Julfar (near modern Ra's al-Khaimah), Jazirat al-Hamrah, Umm al-Qaiwain, Hamriyah, Ajman, Sharjah as well as Dubai all benefit from being situated on a peninsula or a sand spit near a lagoon (*khaur)*, where the local ships could shelter behind a barrage of difficult to navigate shallows and sand banks. Because the hinterland was sparsely populated and its subsistence economy supported little in the way of export or import trade before the pearling industry flourished, shipping from these ports specialized in the carrying trade. Their ships sailed up and down the Gulf, to India, East Africa and most probably at some stage to the Far East and China. Trade on that scale was much influenced by changes in the political climate of the region and beyond. During the latter half of the eighteenth century the Qawasim, the leading clan in the tribal grouping of the northern and eastern part of the country, dominated the maritime transportation and trade at the north of the Gulf. Due to the vicissitudes of history, they later lost this position to overseas competitors, not least to the steamships of British India.

Life in the Musandam Peninsula

A survey of the influence of geography on the economy and, consequently, on the social structures of the population of this area is not complete without a description of the habitat of the Shihuh and their neighbours, the Dhahuriyin – even though the land of most members of these and associated tribes belongs to Oman. Many of these people now live in the UAE or depend economically on her northern ports. The Musandam peninsula (locally called Ru'us al-Jibal) north and east of Ra's al-Khaimah consists of precipitous limestone mountains reaching the height of 2000 m within a distance of barely 20 km from the sea. In most places the wadi walls are vertical cliffs, making communication between them and across the peninsula extremely difficult, particularly since access from the fjord-like openings in the mountains at sea level is equally forbidding. Only a few of the wadis have filled up ancient bays to form an inshore delta, where the run-off water collects in the gravel. In such locations sizable settlements could be established – the biggest one being Khasab in the north of the Sultanate of Oman. The inhabitants of Musandam developed methods with which they could exploit the resources of the sea and the wadis to the full, and grow essential staple food in the mountains.

The economy of one of the two groups found in Musandam is based on the combination of agriculture and husbandry. They refer to themselves as *badu*.[33] The other group has fishing added as a third economic activity and is called *sayyadin*. This occupational differentiation cuts across the tribal divides. The agriculture consists of building, tending and sowing terraced fields in various locations, on the very top of the mountain, on a high slope, or just above the wadi bed. The crop is wheat *(burr)* or barley (*sha'ir)*, which is sown after the winter rains and harvested in March or April. Fig trees are also grown on such terraces high up in the mountains. The rain which falls within the small area of the terrace would not be sufficient to sustain the crops. A network of dams and stone-lined canals has long been in place, to collect water and make it run through channels and openings in the field walls, or to cascade gently over the terraces. Thus a vast area of the rocky surrounding countryside contributes its rainwater.

Nearby are the houses of the owners. They have either a small stone-built house with a flat roof made from beams of the *sidr* tree and covered with brushwood and earth, or a *bayt al qufl*, a 'house of the key'. This type of small house is often built against a rock, with walls made from very large fashioned stones and a floor no more than one metre below ground level. Inside will be some earthenware storage vessels, which – being bigger than the low door – will have been placed there before the house was completed. The large and intricately carved lock on the heavy door gives this type of house its name. This is where the mountain bedouin store their seed grains and any surplus harvested in readiness for a lean year of drought.

Besides crop-farming, the raising of small animals is of equal importance to the economy of the *badu* of Musandam. A family might have a herd (*hawsh)* of between 80 and 130 goats and sheep, along with some donkeys.[34] These animals are taken to locations (which may be some distance from the fields), but where the family has another house and a pen in which to keep the animals at night. The same family may also own a date garden in a coastal oasis, such as Dibba on the East Coast or Khasab in the north, and move there for the date harvest in a group of about one to six families with their animals and few household goods. A house made of palm fronds, situated on the fringe of the oasis, awaits the family in this location.

Between visits, one member of the family may walk from the winter home in the mountains to their date garden in order to pollinate or water the trees. Depending on the geography, the different locations of their economic activities may only be half an hour's walk apart, or they may be separated by as much as a day's climbing or hiking.

The *sayyadin* constitute the larger group of inhabitants of the Musandam peninsula. Fishing is their primary source of income and they live in palm frond houses in settlements by the sea. They own nets and other fishing gear and have at least a share in a *batil*, a local type of seagoing boat. They spend between half and two thirds of the year fishing, but also move up into the mountains to sow grain and tend their fields. In yet another location they own date gardens. Their sheep and goats move with them from place to place.[35] Ra's al-Khaimah and Dibba were the nearest markets where the tribes of Musandam could sell surplus animals, dried fish, and occasionally rent out their donkeys or boats for the transport requirements of the local inhabitants. Therefore, some of the individual tribal groups became quite dependent on a good relationship with the rulers of neighbouring areas, particularly Ra's al-Khaimah, and eventually put themselves under their leadership.

Nomadic Versus Settled Life

In the sandy desert, as well as in the mountains or in the coastal villages, people adapted in different ways to the geographical conditions and to the availability of some resources and the lack of others. In some instances a sedentary existence in one place was not at all possible because the small amount of available water was enough only for a short stay by a small group of people and for the survival of a limited number of date palms. Faced with these conditions, it was essential to adopt a nomadic lifestyle in order to take maximum advantage of the meagre resources spread over a wide area. In other cases, as, for instance, with the fishing communities of Musandam or the owners of the marginal mini-oases in the wadis, mobility has always been required to supplement the otherwise insufficient resources available at the principal abode. In yet other situations, such as obtained for the population in the villages on the East Coast, in the Ra's al-Khaimah area and in the developing ports of the country, the possibilities to pursue a variety of occupations were all close at hand, and such people could lead a settled life.

In the original areas of population concentration, the large oases, various tribes often lived side by side and in many issues of economic or political importance this neighbourhood became the guiding factor in the society's political life. In most villages they also mixed and mingled because one instance of inter-tribal marriage was usually the beginning of further marriages between two groups. But there were also some long-established social differences relating to the ownership of land in these oases – a kind of class distinction, where often the bedouin absentee landlords were at the top of the social structure.

The Impact of Urbanization

The urbanization which set in with the accelerating pearling boom also brought a great mix of tribes into the coastal towns, where they lived in separate areas, forming tribally distinct

quarters, as was already the custom in the large oases. In the nineteenth century it was generally palm frond houses for every family – except for the rulers' forts. During the first decades of the twentieth century an ever increasing number of families could afford to build themselves houses made of coral stone, add an upper floor and even an ornate wind tower for comfort during the hot summer months. The few Indian traders and some Persian-speakers who visited seasonally, or moved to the coastal towns during the pearling boom, remained on the fringes of local society. Some local merchants, who made good money from pearls and from the big increase in general trade, began to seek political influence on the running of their city states. The bedouin in the hinterland were still considered to hold the balance of power by providing a fighting force to the ruler of their choice. There was growing social differentiation reflected in the wealth of the individual families. When the pearling industry went into a steep decline during the 1930s, due to the world economic recession and the introduction of cultured pearls in Japan, the economic hardship hit many families so hard that they eventually decided to emigrate to seek employment in the neighbouring oil-producing countries.

Yet, whether people lived in the coastal towns, the oases, the mountains or in the desert, the families and groups were welded together by their tribal background, their common religious practices and their Arabic language; they wore the same clothes – even if some had more than one set– they ate the same food – though some had more of it than others – and they all endured the rigours of the forbidding climate. Thus, before the advent of oil, the entire population formed one homogenous society.

At the beginning of the twenty-first century, after more than three decades of immigration by foreign experts and labourers have swelled the population figures, the UAE's society as a whole is anything but homogenous. However, for the nationals, the basic structure of their tribal society has remained intact, even though for some families their changed economic circumstances have dramatically revolutionized many aspects of their lives. For others, access to modern housing, education and healthcare have made a great difference, but the basic pattern of their lives has not yet changed. Belonging to a well respected local tribe or an influential family is still of prime importance in today's local society. In spite of the overwhelming majority of expatriates around them, local families socialize almost exclusively amongst themselves. Thus it is not surprising that the traditional local customs are still very much part of daily life. The local people greet one another with the traditional nose kiss. They are instantly recognizable by their traditional clothes, which have remained the same in style even if the materials are more varied and refined than in the past. The women in the family still have a special position and are not expected to share the routine of the men, who have always congregated in the *majlis,* the publicly accessible part of any household. In the *majlis* of the sheikh as well as of the business man or of the fisherman on the coast, matters of state and matters of general interest are discussed, while the tiny cups of unsweetened light coffee with cardamom make the round. Since the days of widespread illiteracy people have kept the memory of legends, stories and the much-loved local poetry called *nabati,* because the spoken word has always been the superior art form of the tribal people, who lacked the raw materials used elsewhere for more tangible forms of artistic expression.

For the benefit of the generations who have not grown up with them, some traditions are upheld with official backing and encouragement, such as camel racing, traditional boating and poetry competitions, while a variety of heritage villages and museums with ethnological

collections are being established. Hunting the migratory bustard *(hubara)* with falcons, which were caught in early winter and released after the season, was practised by many bedouin in the past. Now, this is a sport practised mostly by the members of the ruling families and others who can keep these rare falcons and travel abroad for the hunt. The local tribesman would not begrudge their continuing this 'sport of the kings' as it was known in medieval Europe, because his tribal leader's position should be manifestly different and be recognized as such by the outsider. Among the tribal population an individual's honour and pride is his selfless hospitality. It is an essential aspect of the egalitarian society of the Arab tribes that the hospitality afforded on behalf of the tribe in the sheikh's tent or house should be impressive and reflect the tribe's standing in the eyes of the visitor. The nationals of the UAE of today can have great pride in their country.

[1] See also for the following J.C. Wilkinson, *Water and Tribal Settlement in South-East Arabia. A Study of the Aflaj of Oman*, Oxford, Clarendon Press (1977) pp156ff.

[2] See S.B. Miles, *The Countries and Tribes of the Persian Gulf*, (2nd ed) London, Frank Cass (1966), (1st ed 1919) p 2: 'The tribes that now dispersed and took possession of Arabia were composed of two main stocks, derived from the fourth and fifth generation from Shem. One of the stocks was Kahtan, who identified with Joktan, son of Eber, and colonized the Yemen, or the southern half of the peninsula, while the other, Adnan, who descended from Ishmael, occupied the northern part . . . Under the one or the other of these great progenitors, Kahtan and Adnan, the whole Arabian race is comprised.'

[3] See Wilkinson, *op. cit.*, p 158. With the tribes of the Musandam peninsula the words *batinah, ahliyah or usrah* are also in use; see W. Zimmermann, *Tradition und Integration mobiler Lebensformgruppen. Eine empirische Studie über Beduinen und Fischer in Musandam/ Sultanat Oman*, Göttingen (Dissertation 1981) p 36.

[4] See the example of the tribe of Ma'awil in Fig. 28 in Wilkinson, *op. cit.*, p 163.

[5] The Na'im are spread between Oman, the UAE, Qatar and Bahrain. All members of this tribe belong to one or the other of its big divisions, Al Bu Khuraiban or Al Bu Shamis, which have even adopted separate eponyms *(jadd)* called Khazraj and 'Aus. These divisions are further divided into sections, one of which, the Khawatir living mostly in Ra's al-Khaimah territory, is itself now often considered as a tribe in its own right; see also J.G. Lorimer, *Gazetteer of the Persian Gulf, 'Oman and Central Arabia*, 2 vols., vol.I Historical, vol.II Geographical and Statistical, Calcutta, Superintendent Government Printing (1908–15) Geogr. pp 1301–6.

[6] The members of the Za'ab tribe, half of which lived in Jazirah al-Hamrah in Ra's al-Khaimah territory, but moved to Abu Dhabi in 1970, do not use sectional names, all preferring to be known as Al Za'abi.

[7] The word 'trucial' refers to the fact that the rulers of the states on the southern coast of the Gulf had since 1820 signed several treaties with the Government of India. In British documents the area is also refered to as 'Trucial Oman'. Its extent is approximately that of the UAE today.

[8] See Lorimer, *op. cit.*, pp 1425ff, where a detailed account is given of the written sources and the special investigations concerning the population and the geography of what he calls 'Trucial Oman'.

[9] *Ibid.*, p 1431.

[10] The most populated 'principality' was Sharjah (at the time including Ra's al-Khaimah and Fujairah) with 45,000, then came Abu Dhabi with 11,000, Dubai with 10,000, Umm al-Qaiwain with 5000 and 'Ajman with 750 settled people; see *ibid.*, p 1437.

[11] See K.G. Fenelon, *The United Arab Emirates. An Economic and Social Survey*, London, Longman (1973) p 126.

[12] See Trucial States Council, Development Office, *Census 1968*, mimeograph. For details of the way in which tribal distribution and numbers developed between the first decade of the century and the 1968 census see Heard-Bey, F. *From Trucial States to United Arab Emirates. A Society in Transition*, London, Longman (1982) pp 72ff.

[13] For the ample archaeological evidence of diverse economic activities including copper smelting see D.T. Potts, *The Arabian Gulf in Antiquity* 2 vols., Oxford, Clarendon Press (1990) vol.I, particularly pp 119ff.

[14] See Wilkinson, *op. cit.*, pp 126ff and footnote 6.

[15] The size of the UAE is 83,600 sq.km, of which 86.7 per cent are Abu Dhabi territory, 5 per cent are Dubai; see UAE Ministry of Planning, *Annual Statistical Abstract*, (7th ed) (1992) p 3ff.

[16] The number given varies over time and in the different sources; see also Wilkinson, *op. cit.*, p 54.

[17] The Bani Yas tribe is mentioned living in al-Dhafrah, of which the Liwa is a part, in the seventeenth century Omani source by ibn Razik, Salil *History of the Imams and Seyyids of 'Oman from A.D. 661–1856*, ed. and trans. into Eng. by G.B. Badger (1871) repr. London, Darf Publishers (1986) p70f. The island Sir Bani Yas figures in Balbi's list of 1580.

[18] See Heard-Bey, *op. cit.*, pp 501f and 507–510.

[19] See Heard-Bey, *ibid.*, map 4a p 30.
[20] The WHO recommends that people should not drink water which has more than 750ppm disolved minerals over a long period of time. While date palms can tolerate salinity of over 6000 ppm, camels can drink water with 10,000 ppm. Wilkinson, *op. cit.*, p 58 ff and Heard-Bey, *op. cit.*, p 408. Seawater has 35–40,000 ppm.
[21] See F. Heard-Bey, 'Development Anomalies in the Bedouin Oases of Al Liwa', *Asian Affairs*, vol. 61, part III, 1974, pp 272–286.
[22] See Wilkinson, *op. cit.*, p 59 and pp 71f.
[23] Therefore they do not return by themselves to the well and to their minders, as they do in the summer; they have to be hobbled to prevent them from wandering away too far.
[24] See for more detail Heard-Bey, *op. cit.*, pp 172–175.
[25] Pearls and mother-of pearl are found in three types of molluscs; they are layers of nacre, which are formed around an intrusion, such as a sandcorn.
[26] Dubai being more favourably placed for water, which comes from the precipitation in the mountains, has been used by maritime communities for longer; a settlement in Jumairah dates back to the Umayyad period.
[27] Boats were made of imported wood; to pay for this and the season's provisions required a big community effort. See for further details Heard-Bey, *op. cit.*, pp 182–190 and pp 200ff.
[28] Instances have been recorded where a captain exploited the fact that a particularly good diver could not read and check the season's financial records. See also M.G. Rumaihi, 'The Mode of Production in the Arab Gulf Before the Discovery of Oil' in T. Niblock (ed), *Social and Economic Development in the Arab Gulf*, London, Croom Helm (1980) pp 49–60.
[29] See below p 17.
[30] In this case they are too numerous to list here; the reader is refered to a map of the tribal distribution in the northern area in Heard-Bey, *op. cit.*, p 71.
[31] The Arabic, English and Latin names and valuable information about 200 fishes of the region are given in A. W. White, and M.A. Barwani, *Common Sea Fishes of the Arabian Gulf and the Gulf of Oman*, Dubai, Trucial States Council (1971).
[32] See the sketch map in Wilkinson, *op. cit.*, p 21.
[33] See also for the following Zimmermann, *op. cit.*, pp 46ff; here in particular p 51f.
[34] See *ibid.*, p 57.
[35] For the period of the date harvest in the summer both groups leave their animals unattended in the *wadi* where they own land and a house.

The Beginning of the Post-Imperial Era for the Trucial States from World War I to the 1960s

Frauke Heard-Bey

The UAE never was a colony, but its forerunner, the 'Trucial States',[1] was increasingly absorbed into the British orbit by a system of agreements which successive British governments, first in Delhi and then in London, deemed necessary in order to best pursue their particular objectives of the day.

The First World War was like lightning and thunder bursting forth from the storm clouds which European imperialist ambitions had fomented. This was not the time for letting the privileged position, which Britain had acquired on the Arab side of the Gulf,[2] slip from her hands. Rather, in order to consolidate her hold, it was necessary to be prepared to support the war effort in the Middle East, regardless of whether or not the Gulf became a war zone. During the period before the War, the German plan to nominate Kuwait as a terminus for the proposed Baghdad Railway was perceived as part of an increasing threat to the British position of hegemony in the Gulf. This justified enhancing and elaborating the set of treaties, in which the rulers of the then six Trucial States – like other Arab rulers in the area – had agreed in 1892 to 'on no account enter into any agreement or correspondence with any Power other than the British Government'.[3]

Another important objective was to prevent arms from reaching sensitive areas such as Afghanistan or Baluchistan on the fringe of the British Empire. The countries in the entire region were all closely watched, and eventually treaties were made in November 1902 in which the rulers agreed to 'absolutely prohibit the importation of arms for sale . . . or the exportation therefrom'.[4] In 1911 it was agreed that concessions for pearling, sponge fishing and related economic activities should not be granted except with the permission of the British Political Resident for the Gulf in Bushire.[5] This undertaking had the additional benefit for the local population that no outsiders were permitted to exploit the resources, which were a significant part of their livelihood. Practical benefits for the far-flung Empire, such as way-leaves for telegraph lines or the demarcation of shipping lanes by buoys and lighthouses, were secured as the need arose. Thus a *cordon sanitaire* was thrown around the Arab states of the Gulf, which in the event meant, for the British at least, a well covered flank when Turkey, aided by Germany, engaged in hostilities in southern Iraq in 1916.

After the defeat of the main rivals within the Gulf region, Turkey, Germany and Russia, the previous British political and strategic considerations of the nineteenth century – with the desired effect of denying the littoral states of the Gulf contacts with other European powers

– gave way to the pursuit of economic goals. During the War it had grown evident that access to oil resources had become of prime importance. Finds in Persia and Iraq had already indicated that the entire region could be rich in oil. Therefore, Britain wanted to ensure that in the areas where she had already secured political influence, no other nation would pip her at the post if and when a race for oil concessions were to ensue. Between February and May of 1922 the rulers of the Trucial States gave an undertaking that if the search for oil commenced in their territories they would not grant 'any concession in this connection to any one except to the person appointed by the High British Government'.[6] Similar agreements had already been signed in 1913/14 by Kuwait and Bahrain, although British diplomatic efforts never achieved the same level of influence with Ibn Saud, the new ruler of Central Arabia.[7]

However, for more than a decade British oil companies were unable to take advantage of this privileged position in the Trucial States, because they were committing their capital and resources to the areas where oil had already been found, Persia and Iraq. Oil was then also discovered in Bahrain in 1932, and there were good prospects for discovery in Kuwait and the al-Hasa area – all in American-owned concessions. The London-based multinational consortium, which had been restructured after the First World War to exploit the known deposits in Iraq, the Iraq Petroleum Company Ltd (IPC),[8] secured a concession in Qatar in 1935 with the help of the British government. In the same year IPC formed a subsidiary called Petroleum Concessions Ltd (PCL) in order to secure oil concessions on the Trucial Coast and in Oman and to exclude American companies from these areas.

PCL's negotiations with the individual rulers proved to be tough and protracted and on numerous occasions required intervention by the British Political Agent in Bahrain as the long arm of the British government. The first of these concessions was signed in 1937 by the ruler of Dubai; the last to sign was the newly independent ruler of Fujairah in 1952.[9] The Trucial States had so far been perceived by the British primarily as a string of settlements dominated by the rulers of the coastal city states. From the early 1930s onwards, British policy towards the Trucial States became much more intrusive in preparation for the operations of oil company personnel in the uncharted hinterland. The way in which the rulers dealt with domestic matters was now more closely monitored and, on occasions, severely censored, and the British authorities took an interest in inter-tribal strife and the increasing number of territorial disputes in the hinterland. The frequency, not only of the letters, which were sent to the rulers via the Residency Agent in Sharjah, but also of the visits of one or another of the warships stationed in the Gulf increased, carrying the Political Agent from Bahrain or Kuwait or even the Political Resident from Bushire – depending on the urgency and importance of the matter. The Senior Naval Officer in the Gulf, and even the captains of the ships, were also empowered to conduct political negotiations.

As communications between Britain and its Indian Empire developed to include air travel, and when landing facilities on the Iranian side of the Gulf were withdrawn, the Trucial States were considered as essential staging posts first for military and, later, for civilian planes. The British needed to be successful in negotiating agreements for runways, refuelling facilities and emergency landing strips for their seaplanes and aircraft.[10] From 1932 there were overnight facilities at a purpose-built fortress near a landing strip in Sharjah for the crew and passengers of (British) Imperial Airways. The strategically placed facilities for air communications, in particular at Sharjah, played an important role during the Second World War, and were secured

by constant monitoring of developments in the area through copious exchanges of letters and frequent visits from the Agent in Sharjah, and the British personnel in Bahrain, Bushire, India and London. The oil concessions remained dormant due to the shortage of men, money and steel during the Second World War and for several years thereafter.[11]

In all matters of communication with the British government, the sole addressees in every state were the rulers. Since the early nineteenth century the status of an incumbent ruler had usually been much enhanced by the importance which the 'High Government' placed on a 'Trucial Ruler' to the exclusion of a tribal sheikh in the interior.[12] But from the end of the second decade of the twentieth century, when the decline of the pearling industry spelled great economic hardship for the region, the population in these states, led by the merchants, strongly resented the fact that all the potentially lucrative arrangements and concessions, for which the British government or foreign companies made payments, were agreed exclusively with the rulers. This further enhanced an already existing regional trend to xenophobia and encouraged alienation between the rulers and their people.

After the War the search for oil began in earnest in 1950, when the first drilling rig was erected on the coast of Abu Dhabi. But several dry holes were drilled in locations throughout the Trucial States and its adjacent sea bed, before oil was struck in commercial quantities offshore from Abu Dhabi in 1959 and on-shore in the desert of the same state in 1960. Export facilities were built and shipments began in 1962 and 1963 respectively. The influx of foreign personnel working for the oil companies and, eventually, an ever increasing number of men with the many construction and service companies, made it imperative that their safety was guaranteed while they were working in remote locations. In response to these requirements a British officered local force was established in 1951, the 'Trucial Oman Scouts'. A host of regulations were enacted to ensure their security, to define their legal status in the country as well as to cover many other issues. The Political Agency, staffed by British officials since 1949, was moved from Sharjah to Dubai in 1954, and a new Political Agency was opened for Abu Dhabi in 1957. Legal arrangements for British protected people were made in so-called 'Orders in Council', decided upon in London. The British-made immigration rules were implemented by the Political Agencies. Thus, British involvement on a daily basis became very much more obvious, but, because it coincided with a period of perceptible economic improvement, at least for those people who obtained employment with one of the companies, this was probably less resented than when the oil companies first arrived before the war.

As for the British government's approach to this region within the slowly disintegrating empire, the changes which were sweeping the global political scene in the post-war era also made their mark here. The plight of people in developing countries was being discussed in the United Nations. Britain, too, felt morally obliged to care for the population of this region which was under her domination and from which she had over time benefited so much more than she had been required to care for. Once the necessity to become active in the development of the Trucial States had become widely accepted, several efforts were initiated. The Foreign Office profited from the fact that a number of its members, who came to serve in the Gulf, had already been involved in development in the Sudan Civil Service. They and others were prepared to implement this new approach to the British imperial role – to help to improve the living standards of the people, and to prepare the area of the Trucial States for the changes which were to be expected if oil was found there. The world economic recession of the 1930s,

the decline of the pearling industry, and the impact of the Second World War had combined to reduce the Trucial Coast to poverty. The finances which the British government was prepared to commit to this task were very limited, but a number of dedicated civil servants, engineers, military personnel and other specialists managed to have an impact in several fields and laid the groundwork for the road to development

The rulers of the seven Trucial States were brought together in the 'Trucial States Council', which met regularly and decided upon the priorities for the 'Trucial States Development Office'.[13] Modest beginnings in health care, road building, agricultural extension work, vocational training, statistics and surveys of water and soil resources were made in the 1950s. Such efforts accelerated and brought visible results in the 1960s, when Abu Dhabi began to pay the lion's share for these development projects. This leading role taken by Abu Dhabi already pointed the way forward to the foundation of the Federation of the United Arab Emirates in 1971, an independent state which benefited from the oil wealth of its member states.

With this event the British Political Agency, which had been perceived by many in the country to be the hub of influence and power, was transformed into the British Embassy[14] – one among a fast growing number of diplomatic missions in the country, thus symbolically marking the end of the imperial era in the Gulf.

1 This was the name given to the area (with the exception of Bahrain and Qatar) under the sovereignty of the rulers who had signed the 'General Treaty' with the representative of the East India Company in 1820.
2 The supervision of developments on the Arab side of the Gulf was coordinated by the British Political Resident in Bushire; from 1823 a 'Native Agent' was sent to Sharjah to maintain a channel of communication with this Coast.
3 C.U. Aitchison, *A Collection of Treaties, Engagements and Sanads Relating to India and Neighbouring Countries*, Delhi, Government of India (1933) p 256.
4 *Ibid.*, p 257.
5 *Ibid.*, p 263.
6 *Ibid.*, p 261.
7 See G. Troeller, *The Birth of Saudi Arabia. Britain and the Rise of the House of Sa'ud*, London, Frank Cass (1976) pp 34ff.
8 The shareholding at the time was: 23.75 per cent each BP, Shell, Companie Francaise des Petroles (later Total), and Near East Development Corporation (half Mobil and half Standard Oil Co. of New Jersey) and 5 per cent Mr. Gulbenkian's Participations and Explorations (Partex).
9 See for details F. Heard-Bey, *From Trucial States to United Arab Emirates. A Society in Transition*, London, Longman (1982) pp 296f.
10 See R.S. Zahlan, *The Origins of the United Arab Emirates*, New York, St. Martin's Press (1978) pp 98ff.
11 A team of geologists had visited some parts of the hinterland in 1936 and some seismic investigations had followed in 1946.
12 For instance, the decision as to who should be the ruler in Kalba in the 1930s was entirely a British one, as was the later decision to reincorporate Kalba into the state of Sharjah in 1951 after a series of struggles over succession.
13 See also for the following Heard-Bey, *op. cit.*, pp 319ff.
14 The Agent in Abu Dhabi became the Ambassador to the UAE, while the Agent in Dubai became a Consul General.

The Historical Background and Constitutional Basis to the Federation

Ibrahim Al Abed

Introduction

The United Arab Emirates achieved formal independence as a federal state on 2 December 1971, as a result of two distinct, but related, events. One was the signature by the government of the United Kingdom and the rulers of the seven emirates (formerly known as the Trucial States or Trucial Oman) of separate instruments bringing to an end the treaty relationship that had existed between them since the early nineteenth century. The other was the agreement between rulers of six of the emirates, Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Qaiwain and Fujairah, the previous July, to establish a federation to be known as the United Arab Emirates simultaneously with the ending of the treaty relationship with Britain. The seventh emirate, Ra's al-Khaimah, formally acceded to the new federation on 10 February 1972.

The decision to establish the federation followed the gradual evolving of a consensus that their small population, their small size, (only Abu Dhabi being larger than 1500 square miles), and their poverty (only Abu Dhabi and Dubai being oil producers) did not permit the emirates independently, or in smaller groupings, to establish a viable, independent, political and constitutional entity. This is not to mention those objective factors, whether cultural, religious and social, which the various emirates hold in common.

In January 1968, the government of the United Kingdom had indicated its intention of bringing to an end its treaty relations with the Trucial States, and with two other Gulf sheikhdoms, Bahrain and Qatar, by the end of 1971. During the nearly four years between that British declaration and the establishment of the United Arab Emirates, the ruling families in the seven emirates, along with those of Bahrain and Qatar, together with their advisers, engaged in a lengthy series of meetings and negotiations on the appropriate political and constitutional structure to be adopted upon British withdrawal. These negotiations were initially based upon a search for a nine state federation, including Bahrain and Qatar, and also involved the neighbouring independent Arabian Gulf states of Kuwait and Saudi Arabia, who acted, individually and together, as conciliators and mediators, and, on occasion, as supporters of one or other of the nine intending partners in the federation. The government of the United Kingdom supported the efforts to create a federation and played an important role in the process that led to its eventual establishment.

The creation of the United Arab Emirates in 1971 was the result of the consultations and negotiations in the period since January 1968. The concept of creating some form of constitutional

structure linking together the emirates of the Arabian Gulf, while, at the same time, retaining key elements of their individual and separate identities can, however, be traced back over several decades. An examination of that process is of relevance in analysing the dynamics of the politics of the federation.

The First Proposal for Inter-emirate Cooperation

The first proposal that can be traced for the creation of some kind of association between the sheikhdoms of Bahrain, Qatar and the Trucial States, together with Kuwait, surfaced during 1937, and was put forward by representatives of the colonial power, the United Kingdom. It subsequently created considerable local debate, both within and outwith the ruling families.

At that period, Britain was in treaty relations with all of the nine states as well as Kuwait, under the terms of which, *inter alia*, their rulers could not engage in independent relations with foreign powers, and were obliged to accept the advice of Britain in certain defined areas.

The British presence was centred on the office of the Political Resident, Persian Gulf (PRPG) in Bahrain, although there were other officers and Political Agents in several other states. The PRPG reported to the government of India, then responsible for British interests on the western littoral of the Arabian Gulf, (with the exception of the recently emerged kingdom of Saudi Arabia), while the latter communicated with the Imperial Cabinet in London through the India Office.

The British proposal was presented to the rulers of the states during the course of 1937 (Hamaidan 1967: pp 231–232). According to an interview in the magazine *Al Bahrain* in June 1939 with a member of the ruling Al Maktoum family of Dubai, Sheikh Mana bin Hashar Al Maktoum, it included the following points:

- The establishment of a unified educational system, with a central administrative headquarters in Bahrain, and also a unified postal service.
- The creation of a common nationality, with the abolition of the necessity of passports for travel between the member emirates.
- The unification of the judiciary and legislative systems.

The proposal was also said to include the unification of ground and naval forces under a central command and administration. A federation council was proposed, with each emirate 'to send a representative according to an approved system' while indirect taxation could be levied to raise money for federal expenses. According to Sheikh Mana 'the advice and assistance of Great Britain is to be sought in implementing the project, due to its special relations with these parties, and for being the Arab's ally in more than one part of the world.'

According to another report (*Al Bahrain,* 6.1939), the creation of an assembly was also proposed, with representatives from each emirate, either to be appointed by the ruler or to be elected by the population, having the power to propose financial regulations and to ratify draft legislation put forward by the Federation Council.

The British proposal came at a time when the PRPG and other British officials were deeply involved in negotiations designed to win oil exploration concessions in the Trucial States for the British-controlled Iraq Petroleum Company (IPC). These negotiations were by no means

always smooth and easy and, as a result, relations between Britain and the rulers were not always cordial. Indeed, some rulers were clearly opposed to any proposal which could lead to a greater degree of British involvement in their emirates. Perceived, by the British at least, as being one of the more difficult rulers was Sheikh Shakhbut bin Sultan Al Nahyan of Abu Dhabi.

By 1938, the government of the United Kingdom was pre-occupied with the looming Second World War, which broke out in Europe the next year, and little energy was expended on promotion of the Gulf federation proposal. The contents of the proposal, however, became widely known throughout the states involved, and provoked considerable political discussion, some of which was reflected in local journals. Abdullah Al Zayed, owner of the magazine *Al Bahrain*, made use of his columns to promote the concept of greater integration. In June 1939, in the front page interview with Sheikh Mana Al Maktoum cited above, he commented: 'We pray that the aspirations of Sheikh Mana (for a federation) are realized, so that we can see this plan going beyond the area of thinking towards action'. He then added:

> *We are confident that Their Excellencies Sheikh Sultan bin Saqr* (Al Qasimi), *the Emir of Sharjah, and Sheikh Shakhbut bin Sultan* (Al Nahyan), *the Emir of Abu Dhabi, welcome the plan. We also believe that His Excellency Sheikh Sultan bin Salem* (Al Qasimi), *the Emir of Ra's al-Khaimah, does not see otherwise. There will be no need to seek the acceptance of His Excellency Sheikh Ahmed Al Jaber* (Al Sabah, of Kuwait), *who was the first to think about it* (the concept of greater cooperation), *and has spent much time working for its sake.*

Although no action was taken, either by Britain or by the rulers, to implement the proposal, reports in *Al Bahrain* over the course of the next five years indicated that discussion of the topic continued. On 22 August 1939, for example, the magazine reported: 'We have learned that the Emirs of the Gulf have convened their Councils to discuss (the idea of a federation) and they are happy and keen on their endeavour.'

In the same issue, it published an article described as a summary of reports in other press, including *Arab Association* and *Arab Newsletter.* It reported that:

> *The general belief in the Arab Emirates overlooking the Gulf is one calling for the need for its citizens to be brought closer together so that they may preserve their national identity. These Emirates have carried out 'national propaganda,'* (contacts) *in this respect that is soon expected to bear fruit.*
> *The ruling Emirs have started to view closeness between the Emirates as a factor of* (common strength), *as long as each Emir maintains his own independence in his own state.*

The report again summarized the outlines of the proposal, with more detail on some points. On the unification of posts and telegraphs, for example, it said that fees and salaries should also be defined, and that a single administrative system should be created 'on the basis of the percentage of each emirate in the revenues'. On the creation of a joint military force, it said that the proposal suggested that:

> *Each military unit in each Emirate has its autonomous unit, but* (should be) *linked with the units of the other Emirates in an alliance under one general command and staff. According to the rules of this alliance, the units can participate in defensive and offensive*

manoeuvres in any part within the border of the federation. Each Emirate will have to spend on its military units according to decisions by the General Command. The rules will apply to the ground, naval and air forces.

On the proposed Federal Assembly or Council, the magazine said that it was to be established with representatives from each emirate, chosen 'either by appointment or election, or both, taking into consideration the population of each Emirate'. It added that the Council 'will have to study all laws and regulations issued by the Judicial Council before endorsing them. Each Emirate has to show absolute subjugation, and is responsible for implementing these laws.'

Kuwait, Bahrain, Qatar, Abu Dhabi, Dubai and Sharjah were said to be involved in the plans. *Al Bahrain*, however, added 'the Emirates which are expected to merge are over 20, and those which have been mentioned are only the larger among them'.

At the time, the British, through the PRPG, also recognized the separate identity of Ra's al-Khaimah, Ajman and Umm al-Qaiwain, as well as Kalba, which had been granted recognition in the mid-1930s and was reintegrated into Sharjah in 1951. The emirate of Fujairah, officially recognized in 1952, was also seeking a British acknowledgement of its separate status. The other 'emirates' considered by the *Al Bahrain* editor were not identified, but may well have included some of the near-autonomous inland tribes or small coastal villages like Hirah in Sharjah, which had earlier unsuccessfully sought independent status. 'Considering Britain's position towards this plan,' the paper wrote, 'it is obvious that it does not propose it, but has not opposed it or obstructed it, if it has been brought to its attention.'

In a subsequent issue of the magazine on 28 September 1939, *Al Bahrain* reproduced a letter it said had come from 'a senior (official) on the Omani Coast (i.e. the Trucial States), who asked not to be named and who swore he was ready to exert his influence, and money and blood for the sake of the (federation of emirates) if need be.' The letter, the identity of whose author has not been determined, said in part that the topic of a possible federation of emirates:

has become the main theme for discussions in councils (majalis) and clubs, and the focus of thinking among those interested in the future of the Arabs in this part of their nation. We do not know what share (of attention) *it took in Kuwait, Bahrain and Qatar, although the newspapers which have dwelt on the subject have confirmed the great interest of the inhabitants there.*

The federation of the Emirates is beneficial not only for the Emirates. Its main benefit is for the Emirs themselves, because in order to have such unity, there should be a Federation Council, and a constitution, that guarantees the status of the Emirs, and defines a way of succession to the thrones, as well as preventing any aggression from one party against another, from within and from without, as well as against internal revolts. They (the Emirs) *would be involved in building their countries for the prosperity of their peoples, and in education of their youth.*

The correspondent from the Trucial States went on to refine further some of the suggestions already made on the powers and structure of the federation. These included a proposal that each emirate should be 'called to elect representatives, one to each 4000 inhabitants. The representatives will be from the Emirs or from the people'. He added that he had no objection

to either Kuwait or Bahrain as a base for the Council, but added that he personally preferred Bahrain, because it was an island and in the geographical centre of the region:

> *Considering the fact that all the Emirates have special links with Britain, and that no possible danger to the area's Arabism and existence can arise from this relationship, the Emirates will have to seek assistance from this country* (Britain) *in a way that will ensure the growth and steadfastness of the federation.*

Finally, the correspondent said that the duties of the federation should include 'the task of working towards cementing the links and alliances with neighbouring Arab countries, particularly the Kingdoms of Saudi Arabia and Iraq.' 'Now', he concluded, 'is it not time to take the first step, and for the Emirs to call each other together for a preparatory meeting to discuss this subject?'

The emirs, however, made no attempt to do so, while the PRPG, with his masters in Bombay and London pre-occupied by the Second World War, took no initiatives on the subject. Abdullah Al Zayed, the campaigning editor of *Al Bahrain*, continued to promote the concept of greater inter-emirate cooperation, and to suggest that there was a degree of support from members of the ruling families. On 7 August 1941, the paper reported a statement by Sheikh Sultan bin Saqr Al Qasimi of Sharjah, said to have been made during a visit to the paper, as follows:

> *I pray to God that the Arab Emirs in the Gulf succeed in uniting and in eliminating the causes for differences and discord* (between them). *May He direct them towards forging a unity that brings them together, and puts away hatred.*

On 11 September 1941, Abdullah Al Zayed reported a visit to his office by Sheikh Humaid bin Muhammad bin Salem Al Qasimi, nephew and son-in-law of the ruler of Ra's al-Khaimah, and commented:

> *It is a delight to be able to mention that all the Emirs and dignitaries we have been able to meet from the Coast of Oman* (Trucial Oman) *expect and support the idea that the Arab Emirates on the Gulf unite in an alliance that would make of them one country, as it is one nation, provided that each Emir maintains the right to run his own internal affairs as he does now.*

Al Zayed's continual campaigning and prompting, however, achieved little. Nearly three years later, on 23 March 1944, he wrote an editorial entitled 'Will the Gulf be one state?' It said, in part:

> *Over and over again, we have written about this subject, which is of particular concern to us. The editor of this newspaper has personally ascertained the views of many Emirs and Sheikhs in the Gulf. He is also confident that Great Britain has no objection to this project, if the sheikhs of the Emirates should express their desire for a Federation. It is even probable that it will take an initiative in giving assistance.*
> *We repeat here what we have often said, that the Federation of Arab Emirates in the Gulf does not mean that any Emir will cede his throne, or lose any of his influence or income. On the contrary, the wars between the Emirates will end, to be replaced by lasting peace and stability.*

It is now our hope that the Emirs will convene a conference amongst themselves to complete discussion of the subject, as they have already (discussed it) *individually.*

The proposal during the 1930s for the creation of some form of greater inter-emirate cooperation in the Gulf came to naught, despite evidence that, at least as individuals, some of the emirs supported it. Moreover, the involvement of Britain in the Second World War pre-occupied the colonial power, while in the years immediately after the War, Britain was primarily concerned at a regional level with her impending withdrawal from India and, to a lesser extent, the impact that would have upon her interests in the Arabian Gulf.

The concept, however, was the first concrete formula to be put forward for a form of regional cooperation between the emirates, and was, moreover, a formula that incorporated all of the basic elements that were to compose the basic structure of succeeding plans and proposals. These included the concept that any viable federal structure should acknowledge the separate identity and authority within his emirate of each sheikh, with particular relation to the armed forces and his authority over his own subjects, even if the latter were members of any Federal Council or Assembly. Also included was the concept that any such entity to be established should have a form of collective leadership in which the individual sheikhs should all participate, as well as some form of popular representation, either through selection or election. Significantly, there was also a recognition that at least a tacit approval for any such structure should be sought from the largest Arab states in the region, Saudi Arabia and Iraq. Indeed, some of the emirs were reported to have visited Riyadh to discuss the 1937 idea with the Saudi monarch, Abdul Aziz Al Saud, and to seek his blessings.

The Trucial States Council

The Political Resident, Persian Gulf (PRPG), and his political superiors, had taken no action to promote the 1937 proposal, but in 1952, in the aftermath of her withdrawal from the Indian sub-continent, Britain took her own initiative, which was confined to the Trucial Coast.

At the time, there were seven states or emirates that were recognized as having independent identities, all of which were in treaty relations with the United Kingdom. These were Abu Dhabi, Dubai, Sharjah, Ra's al-Khaimah, Umm al-Qaiwain, Ajman and Fujairah. In the same year, Fujairah had at last succeeded in winning from Britain the recognition as a separate entity for which it had been struggling intermittently for almost a century, while in the previous year Kalba, just south of Fujairah, had been re-absorbed into the emirate of Sharjah, following the extinction of the adult male line of the local branch of the ruling Al Qasimi family of Sharjah.

The British initiative took the form of the creation of the Trucial States Council, an informal body composed of the sheikhs of the seven emirates and chaired by the British Political Agent in the Trucial States, resident in Dubai. The Council was designed primarily as an informal gathering, with no charter, written code or regulations, and its members were given to understand that it was to act as a consultative institution. Its intended purpose during its bi-annual meetings was to discuss matters of common concern and to prepare recommendations for the Political Agent (Fenelon 1973: p 39). Under the terms of the treaties regulating the British relationship with the emirates, the sheikhs were obliged in certain fields, moreover,

to act upon the advice of the PRPG or the Political Agent. During the subsequent years, covering nearly two decades, discussions in the Council centred upon matters of economic development, on services of general interest, such as education, health, traffic control and the control of locusts and on other items, of concern also to the British, such as the total abolition of the smuggling and sale of slaves, citizenship and travel documents (Hawley 1971: pp 25–27).

In 1958, six years after it was established, and in the wake of major changes in the Arab world such as the republican revolution in Iraq and the tri-partite action by Britain, France and Israel against Egypt, the Council, at the prompting of the Political Agent, established three sub-committees, for agriculture, education and public health. In 1964, another major committee, entitled the Deliberative Committee, was established, with the tasks of undertaking preliminary work on the agendas to be placed before the meetings of the Council itself, of deciding upon the priorities for projects and of drafting recommendations for the Council. The committee had two members from each of the Trucial States and met approximately every two months (Hawley 1971: p 25). In 1965, the British Political Agent vacated the chair of the Council, and the member sheikhs then elected a chairman from amongst their own number, to serve for a one year term. The first so to be elected was the ruler of Ra's al-Khaimah, Sheikh Saqr bin Muhammad Al Qasimi (*Al-Azminah Al-Arabiyyah* no. 84, 15.10.1980: pp 6–7).

During the course of 1965, the administrative structure associated with the Council was further developed, with the creation of the Development Office and the Development Fund. These were given the task of coordinating the modest development projects in the seven emirates until the Fund was dissolved, after the formation of the Federation of the UAE, in early 1972. Its duties were then transferred to the institutions of the new state (*ibid.*). The activities of the Fund were financed by the British, who in 1965 increased the budget for the Council's Five Year Plan from £350,000 to £1,000,000, and also made an annual appropriation of a further £200,000 for current development expenditure. Much to the delight of the British, who believed that some of the oil revenues enjoyed by Abu Dhabi, which had begun production in 1962, should be spent in the poorer emirates, when Sheikh Zayed bin Sultan Al Nahyan became ruler of Abu Dhabi on 6 August 1966 he immediately made a grant of a further £500,000 to the Development Fund, with subsequent substantial grants in 1967 and 1968, by which time he was the largest contributor. Other funds came from Kuwait, which was also providing assistance to the emerging educational sector (Fenelon 1973: pp 39–40).

The purpose of this chapter being to examine the gradual progress of the Trucial States towards the formation of the federation, the achievements of the Trucial States Council need not be analysed in detail. It is apparent, however, that the Council was a joint venture that pointed the way towards a federation, and that its formation, and its acceptance by the rulers, implied a recognition of the essential unity, or at least common interest, of the seven Trucial States.

The Council served as a forum for discussion and exchange of views between the rulers, initially under the watchful eye of the British Political Agent. It also provided a framework for cooperation and for the adoption of a certain degree of collective responsibility for common problems that permitted each individual ruler to operate at a level broader than that of his own individual tribe or sheikhdom. As a result, this first concrete experiment in inter-emirate collaboration played an important function in helping to reduce the degree of competition between the rulers and, at the same time, giving them experience in collaborating for mutual benefit.

The Bi-partite Union

In January 1968, the British government informed the rulers of the Trucial States, and of Qatar and Bahrain, that they intended to bring the treaty relationship between them and Britain to an end by the close of 1971, as part of a process of British withdrawal from east of Suez. The British decision meant, in effect, that the Trucial States were to be granted independence, a development that not only took the rulers by surprise, since they had been informed only a couple of months before that such a withdrawal would not take place, but was also one that was by no means universally welcomed. Indeed, the first reaction of several was to ask the British to stay.

One of the immediate results of the British decision was the additional impetus given to the already expanding cooperation between the rulers within the framework of the Trucial States Council. Looking further ahead, however, Sheikh Zayed of Abu Dhabi promptly recognized the need for discussion with his fellows on the nature of any future relationship.

On 18 February 1968, only a few weeks after the British had informed the rulers of their decision to withdraw, the rulers of the two largest and wealthiest emirates, Sheikh Zayed of Abu Dhabi and Sheikh Rashid bin Saeed Al Maktoum of Dubai, met at As-Sameeh, close to their mutual border. The original purpose of the meeting was to discuss and to settle a disagreement over onshore and offshore borders, this being resolved quickly by a cession of territory by Abu Dhabi to Dubai, including the site of today's Port of Jebel Ali. As both rulers may have suspected, the offshore areas involved in the cession of territory were later discovered to contain substantial oil reserves.

Although both rulers had not abandoned the hope of persuading the British to reverse their decision, they also discussed the likely prospects for the region should withdrawal take place. In order to prepare for such an eventuality, they agreed that they would create a two-emirate union which others would be invited to join. The terms of the agreement provided for foreign affairs, defence, security, immigration and social affairs to be union responsibilities, with each emirate retaining responsibility for judicial and other internal affairs (*Rozal Yousif* 2.8.1971). Article 4 of the Abu Dhabi–Dubai Agreement invited the rulers of the other five Trucial States to discuss the agreement, and to adhere to it. The rulers of Qatar and Bahrain were also invited to confer with the rulers of the Trucial States in order to discuss the future of the region as a whole, with a view to seeing whether a common stance could be adopted between the nine separate political units (*ibid.*).

This agreement was short-lived, for the rulers of the other Trucial States, along with those of Qatar and Bahrain, signified their immediate acceptance of the offer to join the new union. On 25 February 1968, the nine rulers met in Dubai, signing an agreement on 27 February to establish the 'Federation of the Arab Emirates'. This agreement was to come into effect on 30 March 1968 (Al Rayyes 1973: p 75). The agreement stipulated that the purpose of the federation was:

> *to cement ties between them* (the members) *in all fields, to co-ordinate plans for their development and prosperity, to reinforce the respect of each one of them for the independence and sovereignty of the others, to unify their foreign policies and representation, and its higher policy in international, political, defence, economic, cultural and other matters.*

It further stipulated that the highest body, the Supreme Council (comprising the nine rulers), 'shall be responsible for issuing the necessary federal laws and that it is the supreme authority in deciding on issues of reference, and shall take its decisions by a unanimous vote.' The chairmanship of the Council was to be 'rotated annually among its members,' with the chairman representing the federation 'internally and before foreign states'.

Under the terms of the Dubai Agreement, executive authority was delegated to a Federal Council which was to act as an executive arm of the Supreme Council. Article 8 of the agreement, however, made it clear that the Federal Council:

> *would carry out its functions to strengthen the collective defence of their countries, with a view to safeguarding their security, safety and mutual interests in such matters as to ensure the fulfilment of their aspirations and realize the hopes of the greater Arab homeland.*

The second chapter of the Agreement defined the top federal, political and executive authorities and the financial structure of the federation, while the third dealt with defence, justice and the site of the capital of the federation. Ultimate political authority was vested in the Supreme Council. This body was assigned the task of drawing up:

> *a permanent and comprehensive charter for the Federation, and the formulation of its overall policies on international, political, defence, economic, cultural and other affairs that are in accordance with the aims of the Federation.*

There was a notable lack of precision on matters of defence, justice and the capital. Article 12 provided that:

> *The contracting Emirates shall co-operate in strengthening their military capabilities in accordance with the right of legitimate defence, both individual and collective, of their existence, and their common duty to repel any armed aggression to which any one of them may be subjected. The Emirates shall also co-operate, according to their resources and needs, in developing their individual or collective means of defence to meet their obligation.*

Article 13, on justice, called for the establishment of a Supreme Court, and for its formation, organization and functions to be defined by law, while the relationship between the Supreme Council and the Federal Council was clarified by Article 10, which stated that 'decisions of the Federal Council shall not be deemed final unless approved by the Supreme Council'. The permanent headquarters of the federation was left to be determined by the Supreme Council at a later stage. Finances were covered, in general terms, in Article 6, which said that 'the general budget of the Federation shall be issued by a decision from the Supreme Council. The law shall fix the budget revenues and the share to be paid by each member Emirate'.

The agreement also stated that local affairs were to remain within the jurisdiction of each member emirate, with precise details to be determined by the Supreme Council at a later date.

The agreement between the nine rulers to form the Federation of Arab Emirates was made at speed, and, in consequence, the terms of the charter agreed upon were loosely worded in legal terms and thus subject to differing interpretations. Although the Supreme Council was to meet on four occasions over the subsequent 18 months, it was unable to reach lasting agreement on any point, except that the federation itself was not viable.

The Failure of the Federation of Arab Emirates

A detailed examination of the various deliberations between leaders of the emirates and of the contacts that took place between them is outside the purview of this chapter. The underlying obstacles that gave rise to the differences between the nine members are, however, of importance in understanding the reasons for its eventual collapse, effectively from the date of the last meeting of the Supreme Council, on 21 October 1969.

One obstacle of considerable importance was inherent in the Charter of the Federation itself. Although the new entity was named the 'Federation of Arab Emirates,' the Charter itself stipulated that its purpose was, in part, 'to reinforce the respect of each one of them for the independence and sovereignty of the others' (*ibid.*).

The agreement, as mentioned earlier, required the Supreme Council to take decisions only on the basis of unanimity, and single rulers could, and often did, prevent such unanimity being reached. Moreover, the agreement was silent on questions relating to the organization and composition of the Federal Council, including the manner in which its members were to be selected. This again, according to one observer, 'handicapped the process of implementation as the Supreme Council was not able to reach an agreement on these matters' (*Al-Azminah* 26. 11. 1980: pp 6–7). The agreement also lacked precision on questions such as the sources of federal revenues and the contribution to be made by each emirate to the federal budget, while an examination of the deliberations of Supreme Council meetings indicates that the Council also failed to reach agreement on these two points (*ibid*.). In addition, there was no clear indication in the agreement as to whether or not the member emirates had agreed to the establishment of a joint defence force. As a result, some rulers supported the unification of the various military and para-military forces, while others insisted on maintaining their own independent armed units (*ibid.)*.

Rivalry over the respective status of the rulers and their emirates was also clear during the life of the Supreme Council, with competition for leadership and for positions. This was particularly evident between Bahrain and Qatar, neither of which had participated in the work of the Trucial States Council that had brought the other seven emirates, and their rulers, closer together in the previous decade and a half. Both eventually decided to withdraw from efforts to create a viable federation, and became separately independent, on 14 August 1971 and 1 September 1971 respectively, although by that stage the Federation of Arab Emirates itself had long since ceased to exist.

The competition between the two emirates, however, permitted Abu Dhabi to emerge as a mediator. Though with a smaller population than Bahrain, and at a lower level of development than either Dubai or Qatar, Abu Dhabi was largest of the nine emirates in terms of size. It was also the wealthiest, with its rapidly expanding oil production far outstripping not only that of Bahrain and Qatar, but also that of Dubai (which did not commence exports until 1968), the only other oil producer in the Trucial States. This, coupled with the generosity of Abu Dhabi's Sheikh Zayed towards the other emirates, helped to make him the person most likely to be acceptable to his colleagues as leader of the federation of the seven Trucial States that was to emerge after the collapse of the federation of nine.

Qatar and Bahrain also disagreed over the site of the proposed federal capital. At the fourth and final Supreme Council meeting it was agreed that Abu Dhabi should be the temporary capital, with a permanent site to be built later between Abu Dhabi and Dubai. When a year later the deputy rulers met in Abu Dhabi to attempt to revive the moribund federation, the question of the capital was again raised and Bahrain withdrew its previous acceptance, rendering the agreement on Abu Dhabi null and void.

Subsequently the federation of the Trucial States that became the United Arab Emirates adopted the same compromise in its provisional Constitution in 1971, naming Abu Dhabi as temporary capital pending construction of a permanent capital, to be named Al-Karamah, on the Abu Dhabi–Dubai border. Both Dubai and Ra's al-Khaimah raised the question of a permanent capital on a number of occasions during the 1970s, demanding that it should be built. The Abu Dhabi Ruler and UAE President, Sheikh Zayed, however, embarked on a process of turning Abu Dhabi into a *de facto* capital. Only financial considerations, plus the rapid creation of established facts in terms of construction on the ground, led the two emirates to drop their demand after 1979. It was to take a further 17 years, until May 1996, before the Supreme Council of the UAE, adopting the provisional Constitution as permanent, finally endorsed Abu Dhabi as the permanent capital.

Another major point of contention between members of the Supreme Council of the Federation of Arab Emirates was the method to be followed in determining the composition of the proposed Federal Council or Parliament. Bahrain, with the largest population, proposed a ratio based on population. Qatar and the others, with much smaller populations, refused (Heard-Bey 1984: p 359). Subsequently, at the October 1969 Supreme Council meeting, Bahrain agreed to the principle of equal representation, with four members from each emirate. At the October 1970 meeting of deputy rulers, however, it retracted its previous agreement, and again demanded a form of proportional representation (*Al-Azminah* no. 95, 14. 1. 1981: pp 6–7). The opposition of the remaining eight deputy rulers led Bahrain's representative to announce his intention of refraining from taking any further part in subsequent discussions 'before ensuring that the Constitution ensures the rights of the people of the Union, particularly in so far as the representation of the people in the Union Council is concerned.' (*ibid.)*

A further unresolved point was the question of voting within the Supreme Council itself. The 1968 Dubai Agreement had originally called for unanimity. The draft constitution subsequently prepared stipulated that decisions on 'substantial' matters should be taken by unanimous vote, but that decisions on other, less important, matters should be taken on the basis of a simple majority. Bahrain rejected this for reasons related to its opposition to other related articles, while, when the subject was raised at the deputy rulers' meeting in Abu Dhabi in October 1970, there were several differing viewpoints (*ibid.*).

Following the collapse of the deputy rulers' meeting in October 1970, it became clear by early 1971 that Bahrain and Qatar had chosen to follow an independent course, and the rulers of the seven Trucial States were obliged to re-consider their plans to deal with the approaching British withdrawal, not least because any remaining hopes that the Conservative government, elected in June 1970, would reverse the decision to withdraw taken by its Labour predecessor had finally been dashed. The British government, too, was eager to ensure that a viable structure of government would exist upon its departure, not least because of the collapse in 1967 of the superficially similar South Arabian Federation. The British government had

sponsored the federation in the area that became independent as the People's Republic of Southern Yemen, with a Marxist government that in 1971 was actively supporting subversion of the existing order both in Oman and in the Trucial States. Equally keen to have a satisfactory agreement worked out, again partly because of the fear of a spread of the virus of revolution from South Yemen, were the governments of the other Arabian Gulf states, Kuwait and Saudi Arabia, both of whom had been actively engaged in promoting the federation of nine concept.

The Bahraini and Qatari decisions represented, at one level, a terminal blow to the embryo federal structure, because both emirates had a substantially higher level of education, and, hence, more qualified local personnel. At the same time, however, their departure, which left Abu Dhabi and Dubai far outweighing their five colleagues in terms of area, population and wealth, made it easier for the Trucial States to move towards agreement amongst themselves.

On 10 July 1971, the seven Trucial States' rulers met in Dubai. Eight days later, six of them announced the formation of the United Arab Emirates. Ra's al-Khaimah declined to join, although not ruling out the possibility of doing so in the future.The discussions leading to the creation of the Federation of the UAE, which centred, in part, on amendments being proposed to the draft constitution for the Federation of Arab Emirates, indicated that substantial differences existed.

The rulers of the small five, excluding Abu Dhabi and Dubai, proposed three key amendments. As far as a federal capital was concerned, they suggested that the plan to build a new capital between Abu Dhabi and Dubai should be abandoned and that, instead, a headquarters for the new federal government should be built somewhere between Dubai and Sharjah, saying that the funds for a new capital would be better spent on development schemes in the emirates that were not oil producers. The five further stressed that there should be full equality between the seven in all respects, including the composition of the national assembly and the voting process within the Supreme Council (Heard-Bey 1984: p 359). Neither Abu Dhabi nor Dubai were prepared to accept these points, the last of which, in particular, was in direct contradiction to the powers they themselves sought.

On the second day of the meeting, four of the five withdrew their support for the proposals they had put forward the day before. Only Sheikh Saqr bin Muhammad Al Qasimi, ruler of Ra's al-Khaimah, continued to press them. In the subsequent days of talks, the remaining six rulers agreed to adopt a revised version of the draft constitution for the defunct Federation of Arab Emirates, the key difference being that decisions by the Supreme Council of Rulers were to be taken by a majority vote, but both Abu Dhabi and Dubai had to be part of the majority. Abu Dhabi was approved as provisional capital.

Sheikh Zayed of Abu Dhabi was elected as the first President of the United Arab Emirates, while Sheikh Rashid of Dubai was elected Vice-President, both terms to run for five years from 2 December 1971, the date on which the treaties with Britain were to come to an end, and to be renewable.

The national assembly, which was given the name of Federal National Council, was to be comprised of 34 members, eight each from Abu Dhabi and Dubai, six from Sharjah, and four each for the three smaller emirates of Ajman, Umm al-Qaiwain and Fujairah. Six places were to be allocated to Ra's al-Khaimah, should it eventually decide to join the federation. It was also agreed that the Constitution should have a provisional status for five years, after which it was to be replaced by a permanent Constitution.

Examination of the provisional Constitution makes it clear that the views of Abu Dhabi and Dubai carried the day, with the four smaller, and poorer, emirates feeling themselves obliged to accept the demands of their more powerful neighbours. They were encouraged to do so by scarcely veiled suggestions being made by advisers to the Abu Dhabi and Dubai rulers that the two had already reached agreement on a contingency plan to press ahead with a bi-partite federation should the others fail to accede to their terms. The smaller emirates were also encouraged to join, however, by the pledge from Sheikh Zayed of Abu Dhabi that his emirate's oil resources would be used for the benefit of all of the federation's members. 'Abu Dhabi's oil and all its resources and potential are at the service of all the Emirates,'(Heard-Bey 1984: p 349). The rulers already had the evidence of Sheikh Zayed's generosity before them, Abu Dhabi having been the largest single contributor to the Trucial States Development Fund since 1968, as noted earlier.

In the discussions leading up to the agreement, as during the previous attempt to create the Federation of Arab Emirates, neighbouring states and the British played an important role. While Kuwait proffered advice and assistance as a mediator, Saudi Arabia made it clear that it would not recognize any federation unless it obtained a satisfactory answer to its territorial claims on Abu Dhabi. The Shah of Iran, for his part, having agreed in 1970 to drop his claim to Bahrain following the results of a test of opinion supervised by the United Nations, made it clear that there could be no possibility of him accepting the formation of a federation among the Trucial States unless he obtained the islands of Greater and Lesser Tunb, belonging to Ra's al-Khaimah, and Abu Musa, belonging to Sharjah.

The British were left with the sometimes difficult task of cajoling and encouraging the rulers of the emirates to proceed to agreement. With the collapse of efforts to create the Federation of Arab Emirates, the rapid approach of the self-created deadline of December 1971 for a final British withdrawal from the Gulf meant that British policy was, at times, a mixture both of carrot and stick. This was particularly true where the smaller emirates were concerned, whose rulers continued to show a reluctance to accept the inevitability of a British departure until almost the date of the actual establishment of the United Arab Emirates.

When intransigence threatened to complicate future acceptance of the federation by Iran, British tactics echoed past imperial attitudes. Thus Sharjah's ruler was informed that he must make an agreement with Iran on sharing authority on Abu Musa, while the ruler of Ra's al-Khaimah, who completely rejected the suggestion that he should cede the Tunbs, found simply that Iran was given to understand by Britain that it would not oppose a military seizure of the islands, particularly if this could take place just before Britain formally relinquished its authority.

At the end of November 1971, with the establishment of the UAE a matter of days away, Sharjah signed a Memorandum of Understanding with Iran on the sharing of authority over Abu Musa without either of the two parties relinquishing its claims of sovereignty. This was followed by a night attack by Iranian forces on the Tunbs, during which a number of Ra's al-Khaimah policemen were killed. The Iranian occupation has continued to complicate relations between the UAE and Iran throughout the course of the subsequent 30 years.

Ra's al-Khaimah's application for membership of the Federation was accepted unconditionally on 10 February 1972, without any changes in the provisional Constitution.

The Federal System

The new state which came into existence on 2 December 1971 had its basis in the provisional Constitution. Adopted by the rulers on behalf of their emirates, it represented a consensus on the form of the state which they agreed to establish, and on the concessions that they agreed to make with relation to a surrender of part of their sovereign powers to the new federal bodies. (In July 1996 the Supreme Council of the Federation decided unanimously to drop the word 'Provisional'. The Constitution thus became permanent.) The Constitution represented, therefore, an expression of the political status quo at the end of the 1960s in the southern Arabian Gulf, including Qatar and Bahrain, in the light of the impending British withdrawal. Both Qatar and Bahrain had taken part in the earlier negotiations that preceded the formation of the UAE, when the Federation of Arab Emirates, grouping all nine emirates, was under discussion. Indeed, one observer has suggested that, had they not been involved in the early stages of the negotiations, 'many compromises which now form part of the constitution would have been settled very differently'. The relationship between Qatar and Bahrain was marked by strong rivalry and competition, encouraging both to introduce a variety of legal formulations into the draft of the Constitution which they believed would either safeguard their own position, or counter the position or influence of the other.

The preamble to the Constitution stipulates that the rulers of the emirates agreed to the Constitution for the sake of, among other matters:

> *Desiring also to lay the foundation for federal rule in the coming years on a sound basis, corresponding to the realities and the capacities of the Emirates at the present time, enabling the Union, so far as possible, freely to achieve its goals, sustaining the identity of its members providing that this is not inconsistent with those goals and preparing the people of the Union at the same time for a dignified and free constitutional life, and progressing by steps towards a comprehensive, representative, democratic regime in an Islamic and Arab society free from fear and anxiety.*

The Supreme Council

The Supreme Council of the Federation (FSC) is the federation's highest authority, and is composed of the rulers or of those designated to represent them. According to the Constitution, the Supreme Council has exclusive executive powers, powers of ratification, and legislative powers. The executive powers lie in the following spheres:

- Acceptance of a new member of the federation. Such acceptance should be unanimous (Article 1).
- Election of the President and the Vice-President from among its members.
- Formulation of the general state policy, in all matters conferred by the Constitution upon the federation, and consideration of all matters that could help to achieve the objectives of the federation, and the common interests of its members (Article 47, clause 1).
- Maintaining supreme control over the affairs of the federation (Article 47, clause 7).
- Drafting its own Rules and Procedures Bill, in which the Council may define those matters to be considered procedural (Article 48).

The Supreme Council also enjoys limited, but decisive, powers of ratification in the following, on which initial decisions may be taken by the individual emirates, the President or the Council of Ministers:

- Approval of any decision taken by two or more emirates on some form of merger.
- Article 143 of the Constitution stipulates that 'any emirate shall have the right to request the assistance of the Armed Forces or the Security Forces of the Union in order to maintain security and order within its territories whenever it is exposed to danger. Such a request shall be submitted immediately to the Supreme Council of the Union for decision.' (While the President and the Council of Ministers may collectively take immediate action if the Supreme Council is not in session, they are obliged to call the Supreme Council into immediate session in order to sanction the move.)
- The Council has the power to endorse or reject any administrative agreements that may be concluded between individual emirates and neighbouring countries.
- It approves the resignation or dismissal of the Prime Minister, upon recommendation from the President.
- It endorses declaration of defensive war upon a proposal from the President.
- It has the power to endorse any decrees from the Council of Ministers on the appointment, resignation and dismissal of judges of the Supreme Court.
- It endorses international treaties and agreements concluded by the Council of Ministers.
- It approves any declaration of martial law by the President provided it has the approval of the Council of Ministers.

The Supreme Council also has an absolute legislative prerogative, retaining the final say on federal legislation. According to the Constitution, the Council of Ministers may propose legislation, which, after discussion in the Federal National Council, is then submitted to the Supreme Council for approval or rejection. The Supreme Council may thus issue any law, with or without consent of the Council of Ministers and the Federal National Council. In view of the dual roles of Supreme Council members as rulers as well as members of the highest federal body, the Council may, according to the Constitution, delegate some of its powers while it is not in session to the President and the Council of Ministers jointly. However:

> *The ratification of international treaties and agreements, enforcement and lifting of martial law, declaration of war, and the appointment of the President and judges of the Supreme Court under no circumstances can be delegated.* (Article 115)

An important aspect of the Supreme Council's structure is the fact that, although each member emirate has a single vote, the votes are not themselves of equal significance. On substantive issues, such as those related to general policy, ratification of agreements, treaties and draft laws, appointment of the Prime Minister, declaration of war, or the imposition of martial law, a majority decision may be taken, but the representatives on the Council of Abu Dhabi and Dubai must be counted among the majority. The principle of a simple majority applies only to procedural matters.

The Supreme Council is, therefore, the supreme authority of the state holding the ultimate strings of executive and legislative powers, whether exclusively or in nominal partnership with other federal organs. The fact that it is composed of the rulers of the emirates, or their

delegated representatives, adds to its powers, since it was the rulers (or their predecessors) who agreed voluntarily to establish the state. The Council, therefore, reflects the independent status of each emirate, while each member derives his legitimacy from his status as a ruler rather than from being a Council member.

Constitutionally, the Supreme Council is a form of collective leadership. The special powers allocated to the rulers of Abu Dhabi and Dubai give them additional weight in the Council, and hence in the federation as a whole, a recognition of the fact that they are the two largest emirates in terms of population, area and resources. This represents a force for a consensus among Council members, since Abu Dhabi and Dubai can determine whether or not a decision is taken on non-procedural matters.

The President

The President and Vice-President are elected by the Supreme Council for a term of five years, which may be renewed, under the terms of Articles 51 and 52 of the Constitution. In the absence of the President, the Vice-President assumes his responsibilities. The President is accorded a wide range of legislative and executive powers under the terms of the Constitution, that can be divided into three categories:

- Powers derived from his position as President, discharged by him alone.
- Powers exercised either through the Supreme Council or through the Council of Ministers.
- Powers exercised through the Council of Ministers.

As chief executive of the state, the President also enjoys other powers that include, *inter alia*, the right to convene and preside over meetings of the Supreme Council. He may also, if the need arises, call a joint meeting of the Supreme Council and the Council of Ministers in his capacity as Commander-in-Chief of the Armed Forces. The stipulation in the Constitution that the President represents the Union externally and internally provides him with real authority in the direction of foreign policy.

The President is also entrusted with signing laws, decrees and decisions sanctioned by the Supreme Council and with supervising implementation through the Council of Ministers, under the terms of Article 54, clause 4.8. Presidential powers include the ratification of treaties and international agreements after approval by both the Supreme Council and the Council of Ministers (Article 47, clause 4, 96, 115, 140, 146) and the declaration of defensive war and of martial law. The President also has the power to nominate the Prime Minister, accept his resignation and terminate his appointment and to appoint the President and members of the Federal Supreme Court, although the latter two must be approved by the Supreme Council.

Under that category of power exercised through the Council of Ministers, the President is responsible for supervising the execution of all federal laws, decrees and decisions, through the Council of Ministers as a whole, and through its members (Article 60). He also appoints all senior officials, both military and civilian, after such appointments are approved by the Council of Ministers.

The President has additional significant powers exercised together with the Supreme Council and the Council of Ministers. He may overrule the rejection by the Federal National Council of draft legislation, or may delete any amendments introduced into such legislation, and may then promulgate it after its ratification by the Supreme Council (Article 110, clause 3 A).

Together with the Council of Ministers, the President also has the power, should the need arise between meetings of the Supreme Council:

> *to promulgate the necessary laws in the form of decrees which shall have the force of law. Such decree-laws must be referred to the Supreme Council within a week. If they are approved, they shall have the force of law, and the Federal National Council shall be notified at its next meeting.* (Article 113)

Legislative powers of the President also include the authority to promulgate decrees, together with the Council of Ministers, provided that these shall not pertain to ratification of international agreements or treaties, or to declaration or lifting of martial law, or to declaration of a defensive war, or to appointment of the President and judges of the Supreme Court (Article 115).

The Council of Ministers

The Constitution describes the Council of Ministers as 'The Executive authority of the Union,' and states that it is responsible, under the control of the President and the Supreme Council, 'for carrying out all the internal and external affairs entrusted to the Union' (Article 60).

The Council of Ministers is, in particular, charged with the following functions:

- Following up the implementation of the general policy of the Union, both internally and externally.
- Initiating draft federal laws, and submitting them to the Federal National Council prior to submission to the President and the Supreme Council for ratification and promulgation.
- Issuing regulations necessary for the implementation of federal legislation.
- Supervising implementation of Union laws, decrees, decisions and regulations by all concerned authorities whether in the Union as a whole, or in the individual emirates (Article 60, clauses 1, 2, 5, 6).

It is not, however, entrusted with the task of formulating the general policy of the federation, but only with the responsibility of following up the implementation of policy laid down by the Supreme Council.

Ministers are officially nominated by the Prime Minister. In practice, an unofficial quota distributes the number of portfolios, and the portfolios themselves, among the individual emirates, rendering the Ministers partially dependent upon the ruler who nominates them.

The Federal National Council

The Federal National Council is essentially consultative, although it is a legislative organ in terms of forms and procedures. It comprises 40 members, distributed according to a fixed pattern. Abu Dhabi and Dubai have eight seats each, Sharjah and Ra's al-Khaimah have six seats each, and Ajman, Fujairah and Umm al-Qaiwain have four seats each (Article 68). Members from each emirate are chosen by their ruler who is free under the terms of the Constitution to choose how to select them and to renew their term, which lasts for two years. Since the inception of the UAE, members have been nominated. However, Article 77 of the Constitution states that a member of the FNC represents the people of the federation as a whole, and not those of his emirate.

The FNC has no ability to propose legislation, this falling within the jurisdiction of the Council of Ministers (Articles 60 and 100). It may only produce recommendations and observations on draft legislation referred to it by the Council of Ministers. The FNC may, however, discuss the draft legislation, and approve, amend or reject it before the Council of Ministers presents it to the President and the Supreme Council. If amendments are suggested by the Federal National Council, the draft legislation, as amended, may be referred back to the FNC by the President. If the Federal National Council continues to uphold such amendments, contrary to the wishes of the Supreme Council, the President may promulgate the legislation after it has been ratified by the Supreme Council (Article 92).

The Federal National Council is empowered to 'discuss any general subject pertaining to the affairs of the Union, unless the Council of Ministers informs the FNC that such discussion is contrary to the highest interests of the Union' (Article 92). The Federal National Council may question Ministers or the Prime Minister on matters within their jurisdiction (Article 93). It may not, however, call for a vote of confidence either in the Council of Ministers as a whole, or in any of its members, since they, individually and collectively, are responsible to the President and the Supreme Council (Article 64).

The Federal Judiciary

A further component of the federal system is the judiciary, of which the highest authority is the Supreme Court, which is entrusted with the following functions:

- It may adjudicate in disputes between member emirates, or between one or more emirates and the federal government, 'whenever such disputes are submitted to the Court upon the request of any of the interested parties' (Article 99, clause 1).
- It has the power to examine the constitutionality of federal laws, if contested by any emirate, and also the constitutionality of any legislation promulgated by one of the emirates.
- It may interpret the provisions of the Constitution upon request from the federal or an emirate government.

The Court's interpretations or judgements are final and are binding upon all parties (Article 99).

Relationship between the legislature and the executive

The Constitution clearly favours the executive rather than the legislature.

The executive, in the persons of the President and other individual members of the Supreme Council, appoint the members of the legislature, the Federal National Council, while the President has the power both to postpone its meetings and to dissolve it. Either the President or the Council of Ministers may initiate legislation, and may veto any amendments put forward by the FNC. Furthermore, under Article 110, clause 4, the Constitution gives the executive power to issue legislation when the FNC is not in session, provided the FNC is notified when next in session. When the Supreme Council is in recess, the Constitution gives the President and the Council of Ministers the authority jointly to issue federal decrees equivalent to federal law, whenever urgent need arises. Thus power ultimately resides with the executive and the legislature participates in decision making only in a consultative capacity.

The Basic Features of the Federation

The formation of the UAE represented a voluntary cession of powers by the rulers of the individual emirates to the new state. This decision was clearly spelt out in the provisional Constitution, adopted as a permanent Constitution in 1996, which stated, *inter alia*, their 'desire to establish an independent and sovereign federal state'. Article 1 of the Constitution depicted the UAE as a 'federal state'. Article 6 emphasized that 'the people of the Federation are one people' and they therefore enjoy, according to Article 8, 'one nationality'. To underline the supremacy of the new state over the emirates, the Constitution granted to the federation exclusive jurisdiction over foreign affairs and the declaration of war, as explained above.

The five federal bodies, the Supreme Council of Rulers, the office of the President, the Cabinet, the Federal National Council and the Federal Judiciary, began operating before mature local authorities had been created. They had, furthermore, the constitutional power, under Articles 60 and 125 of the Constitution, to implement policies, and to exercise jurisdiction directly, without any interference from a local authority.

Paragraph 1 of Article 60 allotted to the Cabinet 'the duty of following up the implementation of the general policy of the federation, both internally and externally'. Paragraph 6 of the same Article stipulates that the Council of Ministers may 'supervise the implementation of the laws, decrees, regulations, and decisions through all relevant parties in the Federation of the Emirates'.

Article 125 commits the governments of each emirate to take all necessary measures 'to ensure the implementation of the laws promulgated by the federation and the international treaties and agreements it concludes, and to issue the necessary local laws, regulations, decisions, and orders to put this into effect'. The same Article bestows on the federal bodies 'the power to supervise the implementation by the local Governments of the federal laws, decisions, international agreements and treaties, and the federal justice verdicts'. The administrative and judicial authorities in the individual emirates are also called upon 'to offer all possible assistance to the Federal authority in this respect'.

While the Constitution emphasizes the individual entity of each member emirate, making the Supreme Council more of a body for the emirates and their rulers than for the people of the federation, at another level it clearly lays down in Article 151 its supremacy, and that of any federal law, decree or decision over those promulgated by individual emirates. Article 99 also gives additional weight to federal legislation, stipulating that the Supreme Court may examine 'the constitutionality of legislations promulgated by one of the emirates, if they are challenged by one of the Emirates on the grounds of violation of the Constitution of the Union or the Union laws'. However, the Constitution imposes no restriction upon any emirate that may wish to withdraw from the federation.

Although the Constitution enumerates the legislative and executive powers of the federation, it also stipulates that all residual powers fall within the jurisdiction of the individual emirates, thus recognizing their status with relation to the federal institutions. The separation of powers between the federation and its constituent emirates is, thus, of considerable importance. While Article 2 of the Constitution stipulates that 'the Union shall exercise sovereignty in matters assigned to it, in accordance with this Constitution, over all territory and territorial

waters laying within the international boundaries of the individual Emirates', Article 3 emphasizes that 'the member Emirates shall exercise sovereignty over their own territories and territorial waters in all matters which are not within the jurisdiction of the Union as assigned in this Constitution'.

The Manifestations of Unity in the Constitution

The Constitution charges federal authorities with virtually all the functions of a unitary state. The Federal Government has thereby been given exclusive legislative and executive jurisdiction in foreign affairs, along with a virtual monopoly over the conclusion of treaties and implementation of international agreements.

Two restrictions with relation to foreign affairs were specified. The first, in Article 124, said that:

> *Before the conclusion of any treaty or international agreement which may affect the states of any of the Emirates, the competent Union authorities shall consult this Emirate in advance. In the event of a dispute, the matter shall be referred to the Supreme Court for a ruling.*

The second, in Article 123, stipulates that individual emirates:

> *may conclude limited agreements of a local and administrative nature with the neighbouring states or regions, save that such agreements must not be inconsistent with the interests of the Union, or with Union Laws, and provided that the Supreme Council of the Union is informed in advance. If the Council objects to the conclusion of such agreements, it shall be obligatory to suspend the matter until the Union Court has ruled on that objection as early as possible.*

Such exceptions do not in themselves bestow an autonomous identity upon the emirates at an international level, since the prerogatives specified are also restricted in several ways, while they are within the rules of the Constitution, and are not absolute rights as with wholly sovereign states.

Internally, the federation, according to the Constitution, was also to have exclusive legislative and executive powers over a wide range of functions. Article 120 lists 19 subjects for which the federal authorities have the sole responsibility, both in legislation and in implementation of laws, regulations and orders pertaining to these matters. Some are directly linked to the nature of the federation, while others represent a surrendering of authority by individual emirates.

The first category includes matters related to the federal armed forces and to defence and security of the federation against all threats, internal or external. The list also includes the following: order in the federal capital; federal employees and the judiciary; federal finances, taxes, royalties and general loans; construction and maintenance of roads deemed to be major highways; federal property; the national census, nationality and immigration; and federal information.

The second category of powers assigned to the federation includes matters that touch upon, and are related to, the sovereignty of each emirate, but which have been transferred by the

rulers to the federal authorities. Two types of powers are incorporated in this category. The first gives federal authorities exclusive legislative jurisdiction over communications, social services and economic matters. The second type allows the sharing of authority between federal and local authorities, whereby the first legislates, and the second uses, the powers under such legislation to issue the necessary regulations to ensure implementation. The areas covered are enumerated in Article 121 of the Constitution, and include labour relations and social security; estates ownership and expropriation for public interests; extradition of criminals; banks; insurance; the protection of animal and agricultural resources; major legislation; courts; protection of copyrights; publications; importation of weapons and ammunition unless for the use of the armed and security forces of any emirate; other aviation matters not within the domain of the Union's executive prerogatives; defining territorial waters and regulating navigation.

The third major formal aspect of unity is the existence of a federal executive authority, whose jurisdiction covers all emirates. This authority implements general policy of the federation, executes federal laws and administers public utilities and services.

Even where individual emirates are assigned power to implement certain matters (Article 121), the Council of Ministers is given authority to supervise implementation of federal laws, whether undertaken by federal or by local authorities.

The Constitution also incorporates other matters within the jurisdiction of the federation. These include the declaration of martial law (Article 146), the elimination of taxes and internal tariffs (Article 11), allocations from the federal budget to finance and implement projects in individual emirates (Article 132), the formation of unified armed forces, and the right to form federal security forces (Article 138).

The existence of a federal judicial authority, including the Federal Supreme Court, is a further feature of the unifying powers incorporated in the Constitution. Article 125 obliges individual member emirates to implement the rulings of the federal courts.

The Jurisdiction of the Individual Emirates

The Constitution states that 'all matters not specifically stipulated as falling within federal jurisdiction are to be considered within the domain of the member Emirates' (Article 116). Thus while the rulers of the emirates decided voluntarily to form a federation, and to surrender to it some of their sovereign prerogatives, they retained, at the same time, aspects of sovereignty on an emirate level. In effect, they kept authority sufficient to ensure that a ruler continues to be the absolute authority within his emirate, and that the emirate itself maintains the essential ingredients of government. The Constitution states in Article 3 that 'member Emirates shall exercise sovereignty over their own territories and territorial waters in all matters that are not within the jurisdiction of the Union'. Residual sovereignty is further identified in Article 10, which states that the federation would seek to safeguard its own independence, sovereignty, security and stability, while taking into account the fact that each emirate should respect the sovereignty of the others in their own internal affairs, within the framework of the Constitution.

In foreign affairs, sovereignty of the individual emirates is more strictly limited. They may, according to Article 123, make 'limited agreements of a purely local administrative nature' with neighbouring states, within the confines of the interests and laws of the federation,

provided that the Supreme Council is given prior notice. The second clause of the article, however, gives each emirate the right 'to retain their membership in the Organization of Petroleum Exporting Countries, OPEC, and the Organization of Arab Petroleum Exporting Countries, OAPEC, or to join them,' whereby such emirates would have (albeit limited) independent international personae. No emirates have, in fact, chosen to exercise this option. The same article also recognized 'treaties or agreements concluded by member emirates with states or international organizations' without specifying any such agreements or their nature. At the same time, Article 124 required federal authorities to consult in advance with any individual emirate 'prior to the conclusion of any international agreement or treaty that might affect the status of such Emirate'. The article thus underlines the right of the member emirates at least to be consulted.

Internally, the individual emirates have retained more authority. They, and their rulers, are the ultimate sources of authority, while federal bodies enjoy specific powers granted by these sources.

At the time that the rulers of the emirates created the federation, in July 1971, they did not enjoy full political independence, then still being in treaty relations with the United Kingdom. Thus the powers granted to the federal bodies did not, in effect, diminish the powers they were accustomed to practise and they preserved the bulk of the functions they considered essential to maintain their own authority. Furthermore, the voluntary surrender of powers, or of part of their powers, by the rulers did not preclude their ability, collectively or individually, at any time, to reverse their previous decision.

The traditional status of each ruler within his emirate gave him the power to block the local implementation of any federal law or decision considered to be unacceptable, or incompatible with his own interests. Each emirate may legislate on affairs within its own borders, provided that such legislation is not in contradiction with the Constitution. Each emirate also specifically has the power to undertake the execution of federal law dealing with local matters.

Article 104 of the Constitution gives each emirate the authority to establish or maintain its own judicial organs, to deal with matters outside the jurisdiction of the federal judicial authorities. In addition, the Constitution also spells out other rights for member emirates that underline their retention of powers, the most important of which are related to the ownership of natural resources and the right to establish special armed forces. Article 23 states 'the natural resources and wealth in each emirate shall be considered to be the public property of the emirate,' and not the federation. Article 142 adds that the member emirates also 'shall have the right to set up local armed forces ready and equipped to join the defence machinery of the Union, to defend the Union against any armed aggression if the need arises'.

Other indications of the independence of the member emirates can be found in Articles 5 and 118 of the Constitution. Article 5 gives them the right to retain their own flags. Article 118 stipulates that:

> *Two or more Emirates may, after obtaining the approval of the Supreme Council, agglomerate in a political or administrative unit, or unify all or part of their public services or establish a single or joint administration to run any such service.*

The Constitution lacks clarity on the funds to be made available for financing of the federal budget. Article 127 says that member emirates 'shall contribute a specified proportion of their annual revenues to cover the annual general budget expenditure of the Union'. The Constitution

does not, however, settle jurisdiction over the collection of, or contribution of, such funds, leaving the financing of the federal budget to be decided on the basis of agreement between all or a number of member emirates. Thus the ability of federal authorities to perform the tasks allocated to them is affected by the budget contributions of individual emirates.

In summary, the power structure in the UAE favours the member emirates rather than the federal authorities, for the following reasons. Firstly, the Constitution, while enumerating the matters within the jurisdiction of the federation itself, left those of the member emirates undefined, covering all matters not specifically assigned to the federal authorities. The emirates are the source of authority, and the federation merely a means for the devolution of part of the authority.

Secondly, the legislative jurisdiction of federal authorities is restricted, in matters that are not federal by nature, to a limited number of subjects, such as communications, education, health, currency and electricity supply. Moreover, the legislative prerogatives bestowed on the federal authorities in accordance with Article 121 of the Constitution are not, in themselves, exclusive. Article 149 gives the member emirates a share of such authority:

> *As an exception to the provisions of Article 121 of this Constitution, the Emirate may promulgate legislation necessary for the regulation of the matters set out in the said Article, without violation of Article 151 of this Constitution.*

Article 149, therefore, conflicts with Article 121, since it permits individual emirates to promulgate legislation even on matters specifically allocated to the federation. The reservation thus spelt out at the end of Article 149 can, however, operate as a balancing factor if the federal authorities decide to challenge any moves by individual emirates that they consider contrary to the provisions of federal laws and decisions. There is a clear duplication of authority in some areas of powers allocated to the federation and to the emirates. In the words of one jurist:

> *Article 120 gives the Federation the exclusive legislative and executive authority on foreign affairs, while Article 121 gives it sole legislative jurisdiction, without executive powers, on the definition of territorial waters and on navigation on the high seas.*

Furthermore, within the federation all legislative powers reside ultimately in the Supreme Council and, hence, the rulers. No federal legislation can be promulgated without approval by at least five of the seven rulers, including those of Abu Dhabi and Dubai. As a result, the local authorities of the emirates, and considerations related to them, are predominant in the sphere of legislation.

Thirdly, executive authority also resides ultimately in the Supreme Council. In addition, the executive powers of federal institutions are restricted to particular and specified matters. The local authorities are entrusted not only with the execution of their own laws and regulations, but also with that of laws and regulations where jurisdiction is shared with the federal authorities, although the latter retain the formal right of supervision. The manner in which the Constitution refers to financing of the federal budget adds to the limitations on the extent of federal executive authority. No such limitations in financial affairs are placed upon individual emirates.

Fourthly, the judicial system laid down in the Constitution neither changes nor limits the status of local emirate judicial authorities. It simply adds a new level of courts, headed by the Supreme Court, which has specific functions. It also permits each emirate, if it so chooses, to merge its own system with the federal system.

Conclusion

Looking back over nearly three decades, the federation is an established fact of life. It is evident that the country's political elite has taken its time to ponder on the various approaches not only to form the federation but also on the way it should evolve. The ratification in May 1996 of the provisional Constitution, amended to include the designation of the city of Abu Dhabi as federal capital as permanent, reflected an acceptance that it had proved its worth. At the same time, it was accepted that further amendments could be made as and when the need for them became apparent, without questioning the fundamental basis of the federation itself. In late 2000, however, there was little evidence of a desire for significant structural change.

If we look back over the years since the UAE was formally created in 1971, it is clear that certain steps have been taken to increase the jurisdiction of some of the federal agencies, in particular in the judicial system and departments involved with immigration and security. At the same time, as member emirates have developed their administrative infrastructure and as the educational system has produced a more numerous and more qualified labour force, so new local departments have been established, dealing with matters such as information and tourism. It should be noted that this development is fully in conformity with the Constitution and represents the natural evolution of the administrative structure of the country as a result of development.

The traditional pursuit of consensus, as reflected within the new political institutions, has meant that the dynamic of the political process has been able to respond to demands for change within the framework of a broadly accepted political legitimacy.

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Formation and Evolution of The Federation and its Institutions

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Introduction

The Trucial States, which in 1971 became the Federation of the United Arab Emirates, did not struggle for independence nor even seek it; it was thrust upon them. When the British government made the decision to withdraw protection from these states it was done without warning, compelled by the then ruling Labour Party's 1968 decision to relinquish the United Kingdom's security responsibilities east of Suez. Thus the rulers of these states, who had grown comfortable in their reliance on British political, diplomatic, and military power in an uncertain and dangerous part of the world, were faced for the first time with the prospect of determining and securing their own destinies. Because this eventuality had not been seriously contemplated and because the British government had taken only a slight interest in the affairs of these states, apart from their strategic importance along the imperial route of communications to India, and then only recently, there had been little preparation for independence and its challenges.

The Confused Prologue to Federation

Despite a widespread perception that the United Arab Emirates and the other small Gulf Arab states are artificial creations of the British, the UAE in fact reflects in its political form and dynamics a deliberate lack of British involvement in the Trucial States' internal affairs until a late date, leaving tribal loyalties and structures largely unaffected. The effect of British intervention through the series of treaties implemented between 1820 and 1892 was to freeze the principal power relationships of tribal groupings. Thus, the Al Qawasim and the Bani Yas tribal confederations which controlled what are now the northern emirates and the emirate of Abu Dhabi, respectively, were confirmed as the dominant elements within the Trucial States. The Bani Yas eventually gained the upper hand in their rivalry with the Al Qawasim, largely because the latter's naval power had been eclipsed by the British and because the Bani Yas were a broad, land-based confederation. The initial British military intervention in the southern Gulf had the effect of altering the power relationship between the two rival groupings. More importantly, by dealing with the Trucial States as a unit, the British gave some sense of natural

coherence to the grouping of the several sheikhdoms signatory to the 1820 treaty and later engagements. For a considerable period of time they were obliged to cooperate in various common, if limited, treaty obligations.

Nevertheless, it is fair to describe the fundamental British attitude towards the Trucial States as one of 'benign neglect,' at least until very late in the long period of British protection.[1] Only concern for control over oil exploration concessions, the development of imperial air routes, the exigencies of the Second World War, and the threats posed by the Soviet Union and Arab radicalism led to a significant upgrading of Britain's own political representation in the Trucial States and to some significant involvement in their social, economic, and political development. One manifestation of this was the creation of the Trucial States Council in 1952 which brought together the rulers of the seven sheikhdoms for periodic meetings (usually twice a year) to discuss issues of common interest.[2] This was done initially with the British Political Agent, the senior representative of the British government in the Trucial States, presiding. Later the chairmanship passed from one ruler to another on a rotating basis. The principal benefit conferred by the Council was to provide a systematic means of regular communication amongst the rulers for the first time. The Council and the Trucial States Development Office (which later carried out modest development projects) provided, during their brief existence, the basis for core institutions of the future independent union. Nevertheless, when the Labour government reached its January 1968 decision to withdraw British protection from the Trucial States, for domestic economic reasons having nothing to do with the sheikhdoms themselves, there had been little tutelary preparation for the new phase.

The time period allotted to the rulers of the Trucial States to prepare for the withdrawal of protection and federation was brief, and was imposed with no warning. Moreover, a lengthy list of other negative factors seemed to militate against the success of whatever state or states might emerge when British withdrawal was effected. A consideration of these factors and how they were overcome is instructive in seeking an understanding both of how the UAE was born and why it has endured.[3] It is true that in 1971 the UAE adapted major governmental institutions from the Trucial States Council (the model for the Supreme Council of Rulers), the Trucial States Development Council (from which the Abu Dhabi Fund for Economic Development evolved), and the Trucial Oman Scouts (core of the federal armed forces). Moreover, one of the seven sheikhdoms, Dubai, had experienced a 'reform movement' as early as 1938, when members of the merchant oligarchy and a branch of the Al Maktoum opposed to the ruler, forced on him administrative reforms, some of which endured.[4] Nevertheless, virtually the whole governing structure of the new federal state had to be devised and constructed in a short time with few relevant precedents and traditions to draw upon.

Another essential item of independent statehood was largely lacking: settled borders. The very concept of exact territorial borders was alien to a tribal society where a sheikh's dominion over people and control over various resources such as water and pasturage, as well as the extent of a tribe's *dar* or range, which waxed and waned according to circumstances, were what mattered. It was not until petroleum exploration concessions were signed that the need for precise territorial definitions of authority was seriously felt. The British made some efforts to promote agreements on boundary lines, notably those of the redoubtable diplomat Julian Walker whose careful research on relevant factors in the Trucial States helped obtain agreement to a significant amount of boundary-drawing. Nevertheless, when the decision to withdraw

from the Gulf was made, all the Gulf Arab states had extensive borders in dispute. This was true of Bahrain and Qatar, which have engaged in territorial disputes since the latter threw off Al Khalifa rule in the nineteenth century, and of the Trucial States, where boundary definition was only partial and deep-seated rivalries absorbed the individual sheikhdoms. These included, most significantly, the border dispute between Abu Dhabi and Dubai which had erupted into warfare in 1948, and the several border disputes of Sharjah and its neighbours. The Abu Dhabi – Dubai rivalry was of particular importance, because those two states would dominate any federation among the Trucial States by virtue of their size and wealth. The success of that federation would presuppose their ability to work together.

A further, critical uncertainty was the fundamental question of which states would come together as a federation. This was generally posed as a matter of whether it would be the seven Trucial States plus Bahrain and Qatar, or the former grouping alone. The uncertainty, however, extended to the question of whether all of the seven would unite. This unsettled issue of who would be in or out continued to vex the process of reaching independence and federation until the British withdrawal; in the case of one emirate, Ra's al-Khaimah, it carried even beyond that point.

Yet another deeply troubling issue which these states faced on the eve of their independence was the claims of powerful neighbours to some or all of their territory. Announcement of the British intention to withdraw from the Gulf brought renewed claims from the Shah's government of Iran to the island of Bahrain. Iran also claimed the lower Gulf islands of Abu Musa and the Tunbs, which belonged to two of the Trucial States, Sharjah and Ra's al-Khaimah, respectively. The other major claimant was Saudi Arabia which had long asserted claims to a large part of Abu Dhabi's territory and saw in British withdrawal an opportunity to redress what it considered an injustice perpetrated and sustained by the British.

Iran and Saudi Arabia presented conventional threats of territorial claims. The new state of South Yemen had emerged in 1967, when its leaders overthrew the Federation of South Arabia which the British had created on the eve of their withdrawal from Aden Colony and its hinterland. This state represented a new and different kind of threat when, in 1969, it came under radical Marxist leadership. South Yemen was a radical revolutionary state whose goal was the overthrow of all the traditional regimes in the region. During the time established for British withdrawal from the Gulf, South Yemen had begun actively to assist a radical leftist organization already in active rebellion against the Sultan's government in Oman. Its name, Popular Front for the Liberation of Oman and the Arab Gulf (in other permutations the organization was known as Popular Front for the Liberation of the Occupied Arab Gulf and Popular Front for the Liberation of Oman), suggested clearly its intent. While the circumstances of pre-independence Aden and the Gulf sheikhdoms were very different in many respects, there was widespread fear that something like what had occurred in South Arabia could occur in the Gulf.

Finally, the rapid evolution towards federation was complicated, if not jeopardized, by British vacillation after the decision to withdraw from the Gulf had been taken and announced. Indeed, there was considerable uncertainty in the Labour government of Harold Wilson even before the decision was taken. By May 1967 the government was seriously considering withdrawal from the Gulf; in the autumn of 1967 the devaluation of the British pound seem to confirm that policy; then in November 1967, two months before Wilson announced withdrawal, the Foreign Office issued an assurance that the British military presence would be maintained in the Gulf region. Following the 16 January 1968 statement, withdrawal remained the policy

until it was thrown in doubt by the election victory in June 1970 of the Conservatives. The government of Edward Heath temporized until 1 March 1971, nine months short of the date projected for withdrawal, before finally affirming that policy.[5]

The factors, then, that militated against the emergence of a successful federation of seven or nine Gulf Arab states were considerable. Informed observers were doubtful of the chances of any such grouping.[6] Interestingly and perhaps decisively, several of these seemingly negative factors had the paradoxical effect of working to the advantage of the future federation.

Britain's unexpected decision to withdraw from the Gulf was a rude shock to rulers who had contemplated development of their oil wealth under the continuing aegis of British-assured security. At the same time, it had the effect of concentrating their attention on the creation of a federation more forcefully than if they had enjoyed a more leisurely approach to those issues. The anomaly of British-protected states in the Middle East would almost certainly have come to an end soon, particularly after the termination of Kuwait's similar protected status in 1961 and the recent withdrawal from Aden and South Arabia. Moreover, further insulation from the challenges of an unprotected existence would arguably have made the eventual transition more complicated and difficult.

In the minds of many observers, a federation of nine was preferable to one of seven, since all the states involved were mini-states with tiny populations and few significant natural resources other than oil and gas. Indeed, Kuwait and Saudi Arabia urged this fully inclusive approach to federation. That it failed, however, was almost certainly an advantage for the Trucial States. The lower Gulf states had reason to fear that Bahrain would try to dominate such a federation, drawing on its much more advanced state administration, greater political sophistication, and a population then larger than that of the other states of the lower Gulf. Further, such a federation would have been riven by the long-standing enmity of Bahrain and Qatar, especially as those two states were closely aligned with Abu Dhabi and Dubai, respectively. The natural ties and habits of community were generally stronger amongst and between the seven Trucial States than in the larger grouping, reinforcing the case for the smaller federation on the basis of geographic contiguity. (Bahrain as an island is physically separated from all its neighbours, though attached now to Saudi Arabia by a causeway. Abu Dhabi's territory at the time adjoined that of Qatar but their population centres were separated by several hundred miles of roadless desert and Saudi Arabia had already strongly indicated its determination to alter its borders with Abu Dhabi to include establishing a Saudi corridor to the Gulf south and east of the Qatari peninsula, an arrangement which was in fact negotiated in 1974.)

At the same time, the meetings of rulers and other representatives from Bahrain and Qatar as well as from the Trucial States between 1968 and 1970 to discuss the possibility of federation were useful in fully exploring the issues that had to be faced. These meetings were, in effect, a kind of intense, practical seminar whose utility was enhanced by the inclusion of the additional interlocutors. Moreover, as one astute scholar has observed, the UAE reaped a very specific and enduring benefit from this exercise. In adopting, with suitable modifications, the constitution which had been drawn up for the projected federation of nine, it gained for its own use a document which had been carefully crafted to accommodate the concerns and interests of all the states in the anticipated wider grouping. Thus the Constitution of the UAE was from the outset an effective source of flexibility and creative ambiguity in coping with the challenges of a federal union.[7]

The collapse of the Federation of South Arabia and the subsequent emergence of a radical

leftist government in Aden, whose goal of overthrowing the Arabian Peninsula's traditional regimes seemed within reach as the rebellion which it was assisting gained ground in Oman, appeared to be a negative and distinctly threatening development affecting the birth of the UAE. In fact it served a highly useful purpose by offering a clear signal to the leaders of the new state that economic and social issues had to be seriously addressed to avoid the possibility of discontent and political radicalization in their own populations.

Sheikh Zayed bin Sultan Al Nahyan, the driving force behind creation of the UAE, had become ruler of Abu Dhabi in 1966. From the start Zayed was motivated by the conviction that it would be politically fatal not to use to its fullest advantage the extraordinary new source of wealth to promote the development of both Abu Dhabi and the poorer Trucial States. The escalating rebellion in neighbouring Oman, in large part a consequence of the ruler Sultan Said's parsimony and the leftward lurch of Marxist South Yemen, confirmed his belief that an improved life for the people of the area was important in securing their continuing support for traditional, conservative, hereditary government. In the years just after he had become ruler of Abu Dhabi, Zayed provided the great bulk of the funds dispensed by the Trucial States Development Fund; after the establishment of the UAE and with the growth of oil revenues he continued to do so on an increased scale.

Thus, early on, Zayed established with the whole Trucial States population the kind of compact that the other Arabian Peninsula oil producers had reached with theirs, whereby rapid economic development and widespread sharing of the wealth would be exchanged for continued acceptance of hereditary, patriarchal rule without political challenge. In the months just before the UAE became independent, he created the 'Abu Dhabi Fund for Arab Economic Development', later called 'Abu Dhabi Fund for Development' to provide aid to other Arab and, eventually, non-Arab countries. This helped to dampen some regional threats as when the UAE and Kuwait used foreign aid to encourage South Yemen to end its aggression against Oman and enter into negotiations which eventually led, in September 1982, to a border settlement and the establishment of diplomatic relations between those two states.

Movement towards creation of a federation among the Trucial States was also accelerated and reinforced by a pattern of various deficiencies among the seven which convinced them that none could go it alone. Ajman, Fujairah, Ra's al-Khaimah and Umm al-Qaiwain all had tiny populations and lacked both significant hinterlands and wealth. Sharjah had prospects of moderate wealth but otherwise shared the deficiencies of the above. All these had divided territories, except for Umm al-Qaiwain, forming a confused patchwork of enclaves and exclaves, while all but Sharjah lacked the modern bureaucratic structures that would be required to manage successfully a modernizing state, unitary or federated. Dubai had considerable wealth, both from its long mercantile career and incipient oil production, and possessed a lean but efficient state administration. It too, however, lacked territorial depth, while Abu Dhabi possessed over 80 per cent of the territory and the lion's share of the hydrocarbon wealth, but had only recently begun to develop the administrative structure which a wealthy, independent state would require. Although Ra's al-Khaimah briefly delayed joining the UAE, it never seriously contemplated existence outside the federation. In a dangerous neighbourhood all the Trucial States realized that if they did not remain together the chances were very high of their being toppled separately. Thus, whatever real differences and rivalries existed, the seven sheikhdoms were drawn together by the strong sense of a shared fate.

A further very great advantage was that the rulers of the seven states could conduct all their discussions and negotiations between 1968 and 1971 in comparative privacy and were able to take action on fundamental issues with virtually no reference to the great majority of their subjects. The process was elite-driven, quintessentially top-down. So long as the rulers maintained the support of their extended families, clans and tribes, they could act freely. Thus, it was possible for key decisions to be taken and implemented quickly without fear of domestic challenge. Had the rulers not been able to move towards federation in this way, it is hard to imagine that the process could have been completed successfully in the brief time allotted to them. This was particularly so as that interval (not quite four years) was further diminished by the lengthy false start towards a federation of nine and by the confusion resulting from the British Conservative government's vacillation on the question of withdrawal.

Formation of the United Arab Emirates

What was undoubtedly of greatest importance in ensuring the UAE's birth and survival was Sheikh Zayed's commitment of his state's resources and his own leadership to the success of the enterprise. Like the Prussian-led German empire, which Otto von Bismarck had created 100 years earlier, the UAE was built around a preponderant state whose leader had a forceful personality and considerable leadership skills. Despite Abu Dhabi's wealth and size, however, only intelligent and energetic exploitation of those assets could assure the birth and survival of the UAE.

It was Sheikh Zayed who began the process of moving towards a federation which would ensure the Trucial States' survival and security and when, at a late hour, the prospects for federation were in serious jeopardy it was he who rescued them. Following Harold Wilson's 16 January 1968 announcement of British withdrawal from east of Suez, including the Gulf, Zayed went almost immediately to Dubai to discuss with that state's ruler, Sheikh Rashid bin Said Al Maktoum, an appropriate reaction. On 18 February 1968 they concluded and announced agreement on a federation between them, urged the other five Trucial States to join, and invited Bahrain and Qatar to discuss the future of the region with them. When, three and a half years later, no federation had emerged with British withdrawal close at hand, Zayed again seized the nettle and engaged Rashid and the other Trucial States rulers in the decisive discussions which determined the essential nature of the UAE.

The last phase of the period leading up to the creation of the UAE began on 1 March 1971 when, following British envoy Sir William Luce's third mission to the Gulf to help determine the British course of action, the Conservative government finally determined on the withdrawal of military forces from the Gulf by the end of December 1971. As Bahrain and Qatar subsequently moved towards independence on their own, Zayed felt the need to act with dispatch. On 1 July 1971 he established Abu Dhabi's first cabinet as well as a consultative council to provide, with the help of advisers and civil servants from other Arab countries, an institutional structure for that state should it be compelled to stand by itself after British withdrawal. Zayed took this action because he feared that the go-it-alone course of Qatar, to which Dubai was closely aligned, might lead the latter to reconsider becoming part of a federation.[8] At the same time he hoped that by dramatically taking the initiative he could induce Dubai and the other Trucial States to unite with Abu Dhabi. Thus, at his urging, the seven rulers met in Dubai

on 10 July in their capacity as members of the Trucial States Council to consider the issue of federation and, on 18 July, formation of the UAE was announced. To achieve a workable union, Zayed first had to come to terms with his powerful Trucial States rival, Sheikh Rashid.

Despite the dominant role of Zayed and Abu Dhabi, the parentage of the new federation was decidedly mixed, with the interaction of two contrasting personalities who represented very different constituencies and interests shaping the birth and development of the UAE. The rivalry was deep-seated, dating to the 1833 defection of the Al Bu Falasah subsection of the Bani Yas in Abu Dhabi to establish a separate sheikhdom in Dubai. The latter became a cosmopolitan, outward-looking mercantile city-state, while Abu Dhabi remained a traditional tribal federation. The personalities of the two rulers perfectly reflected the character of their sheikdoms. Zayed was a forceful tribal leader who embodied the bedouin qualities of courage and magnanimity. He was strongly committed to a truly integrated union of the seven Trucial States and prepared to use his own state's resources generously to secure that end. Rashid was a merchant prince whose pragmatic vision embraced almost exclusively his own state and its prosperity. He was disdainful of less sophisticated neighbours and chary of committing his own state's resources to a larger enterprise. But his careful calculations persuaded him of the practical necessity of creating a political federation with the other sheikhdoms when British protection was withdrawn.

In their negotiations, Rashid's shrewd bargaining skills and Zayed's readiness to be magnanimous to ensure the success of the new union led the latter to make numerous concessions to the former, almost to the point of bestowing political parity on Dubai. Despite their pronounced disparity in size, wealth, and military power, Zayed agreed that Dubai would share with Abu Dhabi the right of veto in the federation's most important governing body, the Supreme Council; and that any substantive issue decided by the Federal Government must have the support of Dubai as well as Abu Dhabi. Rashid insisted on an equal number of votes in the Federal National Council, the UAE's federal advisory body, and secured senior positions for three of his sons in the Federal Government. He himself served as Vice-President. With these far-reaching concessions Zayed secured Rashid's commitment to support the federation, though not his support for Zayed's concept of a closely integrated union. For the rest of his life Rashid consistently supported the Federal Government's essential authority. He would not, however, yield more autonomy than was absolutely necessary and the contention with Zayed over the nature of the union continued long after 1971.

The Constitution and the Institutions of the Federal Government

The Constitution adopted on 18 July 1971 for the UAE was, as earlier observed, an adaptation of the document drafted for the projected union of nine. Its hallmark was its provisional ambiguity, designed to gain the approval of states and rulers with differing views of the federation into which they were entering. (The Constitution was made permament only in 1996.) This, in part, explains its length (151 articles) and the seeming contradiction between some of its stated principles and goals.

The language of the Constitution's preamble suggests that it is meant to be seen as a document charting an evolutionary course towards a new kind of government. Thus, it commits the union to progress 'towards a complete representative democratic rule' but precedes that with the

observation that federal rule must be established 'in harmony with the Amirates' existing conditions and potential,' clearly indicating that traditional social and cultural norms would shape the new state's evolution. Another interesting juxtaposition of modern, secular values with traditional values occurs in the articles dealing with religion. Like the constitutions of most other Arab countries, Islam is recognized as the official religion of the union (Article 7). At the same time, the 'freedom to exercise religious worship shall be guaranteed . . . provided it does not disturb public peace or violate public morals' (Article 32), and discrimination between citizens or inequality before the law on the basis of religion is explicitly rejected (Article 25).

The Constitution combines both blueprints for Western, representative institutions and formulas for preserving political power as exercised by traditional, patriarchal, elites. Thus, the pattern of governmental authority that was established betrays a marked contrast of both provenance and stated goals. The Federal Supreme Council – sometimes referred to as the Supreme Council of the Union – represents the union's highest political authority and has both executive and legislative powers. It sets the general policy of the UAE, elects the president and vice-president, ratifies federal laws and international treaties, and prepares the federal budget. Each ruler has a single vote and procedural matters are determined by a simple majority vote, but substantive issues require the concurrence of both Abu Dhabi and Dubai, reflecting the formula worked out between Zayed and Rashid, thus giving veto power to each. This explicit apportionment of political power represents a departure from traditional norms which emphasize decision-making by consensus (*ijma'*).[9] At the same time, membership in the Supreme Council is established on the wholly traditional basis of leadership of the tribes or tribal federations that dominate each emirate, thus giving institutional form to paternalistic, authoritarian rule. The substantial role of the president also reflects something of the society's patriarchal norms. He convenes and presides over the Supreme Council's meetings, represents the UAE in its foreign relations, oversees the implementation of federal laws and decrees, can commute judicially imposed sentences, and must approve the execution of any death penalty. With the Supreme Council's approval, he appoints the prime minister and, in consultation with the latter, appoints federal ministers. With the concurrence of the federal cabinet, or Council of Ministers, he appoints senior government officials.

The Council of Ministers also combines executive and legislative functions, but may be regarded as the real seat of legislative authority. Most laws are initiated in the council and it establishes regulations necessary for the implementation of federal laws. It also prepares the federal budget and supervises implementation of federal laws and decrees, Supreme Court decisions, and international treaties. Currently the Council of Ministers comprises 21 members, of whom ten are from ruling families. The balance are chosen as much for their positions in the emirates' elites, typically from merchant families close to the rulers, as for their technical and professional abilities. Thus, in the Council of Ministers, the most important government institution in which the politics of balance and inclusion are played out, that process is effectively limited to the members of ruling families, close commoner allies, and a handful of technocrats.

The Federal National Council (FNC) in its formal structure appears to approximate most closely a federal legislature. In spite of the fact that the Constitution devotes no fewer than 26 articles to describing the structure, functions, and prerogatives of the council, its powers are only advisory and it has, therefore, little capacity to affect the political process. Although the Constitution grants the council the power to approve, amend, or reject draft laws (Article 89),

it makes clear that the Supreme Council can ratify and the president issue a law regardless of the FNC's action (Article 110). The FNC has 40 members with its seats allotted according to a weighted formula which gives Abu Dhabi and Dubai eight each, Sharjah and Ra's al-Khaimah six apiece, and the remaining emirates of Ajman, Fujairah and Umm al-Qaiwain four each. It meets for annual sessions of not less than six months and members serve two-year terms, indefinitely renewable. The FNC was viewed at its creation as a means for promoting a stronger sense of community at the federal level and, presumably to that end, leaves open the possibility of popular election of its members. In practice, however, because each ruler has continued to select trusted supporters from the various emirate elites, the body does not represent the people of the UAE in a meaningful way.[10] Its deliberations can produce thoughtful critiques of draft legislation and it can and does raise issues of broad public concern through the questioning of ministers. Yet, in its essential nature, the FNC resembles more closely a traditional consultative *diwan* or *majlis* than a modern representative body.

The Constitution establishes a federal judiciary whose highest authority is the Supreme Court (sometimes referred to as the Higher Federal Court) and which also includes Courts of First Instance. The Supreme Court, whose president and member judges are appointed by the UAE President with the approval of the Federal Supreme Council, can rule on the constitutionality of federal laws, interpret the provisions of the Constitution, deal with inter-emirate disputes or contentions between individual emirates and the Federal Government, and serves as the nation's final court of appeal. The Courts of First Instance have jurisdiction over administrative, commercial and civil disputes between individuals and the Federal Government, as well as criminal and civil cases occurring in the federal capital (Article 102). The way in which the federal judiciary is defined, as in the cases of the other institutions of the Federal Government, reflects an attempt to embody both modern, Western norms of justice in the UAE and those of traditional Arab–Islamic society. On the one hand the Constitution defines all citizens as equal before the law, explicitly forbidding discrimination on the basis of religion and social status (Article 25) and it establishes that those accused of breaking the law are to be considered innocent until proven guilty (Article 28). On the other hand all judicial matters not delegated to the federal courts are left to local judicial bodies in the individual emirates (Article 104). This means that local justice is dispensed under the close supervision of the local ruler in traditional fashion. Moreover, a recent decree has given authority in nearly all criminal cases to *shari'a* courts (Muslim religious courts) rather than to civil courts.[11] At the federal level, however, the judiciary is the one branch of government which, as one scholar has noted, really represents the ideal of an integrated state.[12]

The Federation Secured

After an accelerated gestation period and anxious birth, the UAE's federal authority faced several potentially serious challenges in its infancy. In February 1972 the ruler of Sharjah, Sheikh Khalid bin Muhammad Al Qasimi, was assassinated by a cousin who had previously been removed by the British as ruler. This affirmed the primacy of federal authority over that of the Al Qasimi tribe which traditionally would have selected the new ruler. The Federal Government intervened to thwart the coup attempt and installed as the new ruler Sheikh Sultan

bin Muhammad, who had been UAE Minister of Education. Later in the same year Sharjah and Fujairah clashed with loss of life over a small disputed parcel of territory. Once again the Federal Government successfully intervened to assert its authority and impose order.

These and other successful assertions of federal power, combined with the 1974 Abu Dhabi–Saudi Arabia border agreement and the crushing of the rebellion in Oman's Dhofar Province in 1975, had removed doubts about the UAE's ability to survive within the first few years of its existence. Moreover, in keeping with Sheikh Zayed's concern for making tangible benefits available to the federation's populations, the UAE launched major programmes of physical and social infrastructure. In a very short time, modern highways joined all the population centres of the country (at independence, Abu Dhabi town and Dubai, separated by over 100 km of desert, were linked by dhow or four-wheel drive vehicles) and rapid construction of large scale housing projects and schools proceeded throughout the UAE. These were all visible and compelling evidence, most dramatic in the poorer emirates, of the benefits conferred by the Federal Government and helped to consolidate its legitimacy and support early on.

There remained, however, the question of whether the union would take the form of a centralized state, with the seven emirates closely integrated under the Federal Government, or would pursue a gradualist approach towards greater federal power with each emirate retaining its essential autonomy. Sheikh Zayed, as we have seen, embodied the former concept of the federal role and Sheikh Rashid the latter. While Rashid did not hesitate to support Zayed in the assertion of federal authority to thwart the 1972 coup attempt in Sharjah, he was, from the beginning, steadfast in opposing any significant enhancement of federal power or corresponding diminution in the exercise of emiral autonomy. The starkly opposed visions of the two leading political figures of the UAE on a fundamental issue of the nation's political structure and dynamics precipitated a series of what may be described as constitutional crises.

In 1976 Rashid and some other rulers, in opposition to Zayed, refused to accept a strengthening of the Federal Government and Zayed threatened not to serve another term as UAE President. He was induced to reconsider when general agreement was reached on unification of defence and security forces while the matter of adopting a permanent constitution (called for in the document itself after five years) was simply deferred. This compromise accord also left open the important issues of whether oil resources should be owned and immigration policy determined by the Federal Government. Twenty-five years later, moreover, the defence and security forces have not been fully integrated at the federal level. The 1976 crisis established a pattern whereby every five years the president would be continued in office and the Constitution would remain provisional while basic questions concerning federal and local powers were essentially deferred. It was in early 1979, however, that the most serious such crisis arose when, in part because of the threats to regional stability perceived in the Iranian revolution and the imminent Israeli-Egyptian treaty, the Federal National Council and the Council of Ministers urged the Supreme Council to adopt plans to make the UAE stronger and more cohesive.

Through the spring of 1979, the matter continued to be debated, and it was only when a senior member of the ruling family of Kuwait intervened that it was resolved. Rashid agreed to become Prime Minister (as well as Vice-President), implying greater support for federal authority but, again, with no meaningful movement towards the more integrated union that Zayed desired. The ongoing dispute between the unionists (*wahdawis)* and the federalists (*ittihadis)* will continue, rooted in the deliberately ambiguous compromises of the Consti-

tution and not susceptible of obvious solution because of the veto power which Zayed felt compelled to yield to Dubai to win that emirate's adherence to the union. While the Constitution is flexible in its interpretation of federal and local powers, it is inflexible in terms of the process by which it can be amended.[13] This difficulty did not disappear with the death of Rashid in 1990, as Dubai and the other emirates continued to see their interests as best served by a looser federal structure than that favoured by Zayed and Abu Dhabi.

Although the positions of the rulers on the Supreme Council would seem to preclude the creation of a stronger union through amendment of the Constitution, there has been some strengthening of federal authority. Shortly after the creation of the UAE, greater consolidation of federal powers was achieved when Abu Dhabi merged its cabinet with that of the Federal Government and Sharjah and Fujairah combined key departments of their governments with the corresponding federal departments. In the area of external security, the 1976 agreement gave at least formal expression to a federal UAE defence force, though real progress towards the goal has been slow. Further, there has been a diminution in the tendency of individual emirates to exploit their constitutional rights to pursue limited, independent foreign policies. No emirate has exercised its right to separate membership in the Organization of Petroleum Exporting Countries (OPEC) or, with the exception, briefly, of Dubai, the Organization of Arab Oil Exporting Countries (OAPEC) and Abu Dhabi has extended its OPEC membership to the whole federation. While Dubai and Sharjah caused embarrassment to the Federal Government by following independent courses of action towards Iran during the Iran–Iraq War, the experience of the Gulf War and the continuing intractability of the UAE dispute with Iran over Abu Musa and the Tunbs seems to have helped to forge a more unified position towards the region and its dangers. Finally, in the twenty-fifth anniversary year of the UAE, both the capital and the Constitution lost their provisional nature. The Constitution's call for the creation of a new capital midway between Abu Dhabi City and Dubai yielded to practical reality, with Abu Dhabi now recognized as the permanent capital, and the Constitution at last ratified as a permanent document. This provided appropriate symbolism at the country's quarter century mark in its suggestion of the federation's permanence.

While the *wahdawi-ittihadi* debate remains unresolved, there is much to suggest that the UAE will endure as the one really successful example of political union in the Arab world. (The Yemen Arab Republic, or North Yemen, merged with the Peoples' Democratic Republic of Yemen, or South Yemen, in 1990, but was maintained only by the North's military defeat of the South's attempt to secede in 1994.) The extent of the UAE's oil wealth is such that a high standard of living can be sustained for a long time, acting as an effective emollient for any political disaffection. Despite Iranian occupation of the lower Gulf islands claimed by the UAE, the country now enjoys much greater regional security than it did during its first two decades of existence. Inter-emirate border disputes have been largely resolved and rivalries, particularly that of Abu Dhabi and Dubai, have acquired a friendly character and appear unlikely to provoke really dangerous disputes.

Key to the federation's survival and stability has been the continued strength and vitality of tradition, combined with continuity in the institutions of government. The federal institutions created by the Constitution, despite their modern form, have operated in accordance with well established norms of traditional exercise of political authority. Both legislative and executive powers remain firmly in the hands of a hereditary elite whose legitimacy derives from effective

family and tribal leadership, reinforced by the wealth at its disposal. Equally important, the system as it has evolved has preserved key traditional institutions themselves. Thus, by well-established custom, rulers and other members of ruling families hold *majlises* or councils where subjects are invited to present petitions or raise issues. This mechanism and the inspection tours that bring Zayed and other UAE leaders close to their subjects provide means of personal communications between ruled and rulers which, despite the rapid growth and urbanization of the population, remain effective.

Moreover, together with the gradual consolidation and strengthening of federal authority noted above, there has been a noteworthy development of local government. Abu Dhabi has retained and extended its own central governing authority, established before independence, the Executive Council, under Sheikh Khalifa bin Zayed, the Abu Dhabi Crown Prince. Under this council, an Eastern and Western Region operate to make government more manageable in the largest and most populous of the emirates, together with a Consultative Council, parallel to the Federal National Council, and appointed municipal governments in the two large cities of Abu Dhabi and Al Ain. Roughly similar local governments, varying greatly in size and complexity with the size and wealth of the emirate in question, have been developed in each emirate. They deal with a range of local issues such as water and electricity supply and public works, as well as with external affairs, such as trade, in which the Constitution permits them significant independence. Paralleling this has been the development of municipal authorities in the other emirates, all of which, except Fujairah, are overwhelmingly urban. With its two enclaves on the east (Gulf of Oman) coast, Sharjah has devolved considerable authority to the local government in Khor Fakkan and Kalba.

Without question the most important factor in sustaining the UAE for 30 years and endowing it with its present strength and stability has been Sheikh Zayed's leadership, as notable for its longevity as for its effectiveness. From 1946 to 1966, as the representative in Al Ain of his brother Shakhbut, Zayed displayed special talents for securing and maintaining the loyalty of the tribes and gained a reputation, especially in his management of the local irrigation systems, for dedicated stewardship of the state's resources and their utilization for the people's benefit. As ruler of the whole emirate from 1966, Zayed combined these capabilities with the mastery of genealogical politics, the key to successful governance of a patriarchal state, by carefully distributing both incomes and positions of authority among the branches of the ruling Al Nahyan clan. Within the fairly narrow confines of the traditional system he has practised the politics of inclusion, ensuring the support of the *ulema* or religious scholars who apply the *shari'a*, as well as tribal elements and leading commoner families. Zayed naturally projects the bedouin qualities important to establishing legitimacy in the eyes of his followers. Thus he displays generosity in personal and official behaviour and, in stark contrast to the ruling family of neighbouring Saudi Arabia, evidences an almost austere lifestyle. A central factor in securing Zayed's legitimacy as ruler of Abu Dhabi and the UAE is his solicitude for Islamic education and institutions and his own unostentatious but sincere Islamic piety. His view of Islam emphasizes a flexible pragmatism which contrasts with the strident, confrontational nature of views expressed elsewhere in the Arab world and has helped to prevent the development of Islamic extremism in the UAE.

What is perhaps most striking about Zayed is his ability to embody and help sustain a system of traditional social, cultural, and political values while intuitively understanding and

effectively dealing with the modern world which has thrust itself upon Abu Dhabi and the UAE. But if his leadership credentials have to do with flexibility and broadmindedness, they derive equally from his ability and determination to champion the causes of those for whom he bears responsibility. He has established his credentials as a nationalist, first in defending and advancing the interests of Abu Dhabi, then those of the UAE. Whereas Rashid had been concerned with protecting his emirate from the consequences of the Saudi claim to Abu Dhabi territory, Zayed has made the Iranian actions against the islands, long claimed by Sharjah and Ra's al-Khaimah, fully a UAE question. Indeed, at the international level he has acquired something of the character of an Arab elder statesman, especially through his efforts to mediate the Iran–Iraq war, but also with regard to South Yemen and Oman and North Africa as well. All this has added to his stature as a father figure enjoying great admiration and affection throughout the UAE. Seldom if ever has an individual been so identified with the birth and development of a new country.

For so long as Zayed remains President of the UAE the country's survival and stability seem assured. He is, however, over 80, though in good health, which gives some urgency to the matter of what may happen after his passing.

What Lies Ahead?

Thirty years on, one could offer a compelling argument that the UAE can continue indefinitely on a secure and stable course without changing the institutions of government as they are today. In an astonishingly brief time it has made the transition from one of the world's poorest states to one of the wealthiest, securing the benefits of that wealth to all the population. There is no appreciable discontent or call for change and the people enjoy a considerable degree of freedom, with none of the repression that is all too common elsewhere in the Middle East. A pragmatic balance has been struck in the authority wielded by federal and local institutions of government which might well be the envy of devolutionary Republicans in Washington, DC. A modern, or at least modernized, state has been established on a solid foundation of traditional values and habits of governance.

It is interesting, in this regard, to reflect that even before the UAE and its sister Gulf Arab states had emerged from British protection, the conventional wisdom among most scholars and other analysts had consigned them to an early demise as feeble anachronisms while the secular, military-based, Arab socialist regimes of the day were hailed as the models of the future. The traditional, tribal, patriarchal states have endured and prospered while the careers of the bold new experiments of the 1950s and 1960s have fared less well. Moreover, in part due to Zayed's astute foreign aid diplomacy, the region is far less threatening than before. Indeed, with the defeat of Iraq in the Gulf War and the demise of the Soviet Union, the current regional and international environments are probably more favourable than at any time since the birth of the UAE. What might cloud this picture and suggest that the evolution of the federation's governing institutions is not or should not be considered complete?

The 1999 Yearbook of the UAE Ministry of Information and Culture states that:

Since the establishment of the Federation in 1971, the seven emirates comprising the UAE have forged a distinct national identity through consolidation of their federal status, and now enjoy an enviable degree of political stability. The UAE's political system, which is a unique combination of the traditional and the modern, has underpinned this political success, enabling the country to develop a modern administrative structure while at the same time ensuring that the best of the traditions of the past are maintained, adapted and preserved.[14]

It is difficult, however, to believe that such a neat dichotomy can be maintained indefinitely. The forces of modernization and change cannot be easily segregated and contained and will undoubtedly exercise progressively an impact on the political institutions of the country. Although, as noted above, there is no significant popular call for political change, a growing sentiment for democracy, or at least for increased political participation, may be found among the elites of the UAE and other Arab states, given voice by intellectuals, businessmen, and others.[15] The international arena, following the Gulf war of 1991 and the collapse of the Soviet Union together with the unchallenged global role of the United States, appeared to favour strongly the adoption of more democratic governments. Even if this impulse continues to wax and wane, it remains a force of consequence. Perhaps more important is that the educated elite of the UAE, which favours greater political participation, is growing.[16]

At the same time, there are, as many scholars have noted, significant obstacles to the introduction of democracy, not only in states with traditional, autocratic forms of government, but in the Arab world generally. In a country like the UAE, where most wealth has been generated through activities of the state, no strong middle class such as brought about the rise of democracy in the West has emerged. A civil society of associative linkages among citizens is only present in embryonic form. Even more fundamentally, it has been pointed out that democracy is not something which political leaders can bestow. It must emerge from a political culture and, in that regard, one is led to ponder that in an Islam-based society the source of legitimacy for political rule is God's command, not the accountability of rulers to the ruled.[17]

The dilemma, then, is how to manage an evolution from what one wag called a 'shu'ocracy' to democracy, however the latter may be defined. Without attempting an answer, it is certainly the case that it will be hard to compensate for the loss of Zayed's leadership when he departs the scene, even though there is wide popular support for the existing institutions. It may be wondered if the UAE could have weathered the 1972 coup attempt in Sharjah had not leaders of Zayed's and Rashid's stature been present and used their prestige in asserting federal authority. It could also be questioned whether the fall-out from the 1987 coup attempt in Sharjah could have been contained without Zayed's dominating presence. Certainly Zayed's commanding personal authority was a key factor in seeing the country through a long period of menacing external threat.

At the same time, the UAE and its institutions have now developed a maturity that did not exist in 1972 and was only partially apparent by 1987, the events of which helped in the process of its development. Stability and continuity are not only part of the political scene, but the pursuit of them is now a fundamental part of the political process. Thus while the personal style of the individual holding the office of President will, inevitably, change, the political traditions that have been established should contribute towards an unambiguous transfer of power. With the selection of the president in the hands of the seven rulers, the process is

really an exercise in traditional *shura* (consultation) and *ijma'* (consensus) among tribal leaders. When the leader (who has until now dominated the UAE and been the only real choice for president) has passed from the scene, there will be no obvious criteria, apart from Abu Dhabi's size and wealth, to determine the selection of his successor.

For many years, Zayed has effectively relinquished the majority of the domestic functions of the ruler of Abu Dhabi to his Crown Prince, Sheikh Khalifa. At the same time some presidential duties have also been progressively relinquished to Sheikh Khalifa, who will, thus, have had a considerable apprenticeship before his expected assumption of the presidential mantle. Khalifa has been handling state affairs especially in the absences of the President, and sharing in the decision-making inner circle in all matters for the state for almost three decades. He has also led the UAE delegation to Arab meetings, such as the summit in Cairo in 1996, marking the first time since becoming UAE president in 1971 that Zayed had not attended an Arab summit.[18] Khalifa may prove to be a capable successor to his father as UAE President. What is certain is that, however able he and subsequent leaders of the country may be, they cannot hope to enjoy anything like Zayed's stature. It has been the country's singular good fortune to have had as its principal architect and sole leader in its first 30 years of existence someone who could personify the state and serve as a father figure to all its people. In part, however, that has also contributed to the difficulty of creating, or even seriously contemplating the creation of strong, popularly based political institutions for the future.

The era in the lower Gulf which produced and shaped Zayed has passed. His like will not be seen again in the UAE or elsewhere. In an uncertain future, without a dominant personality to embody the nation and speak for its people, the old autocratic, tribal order, whatever its virtues, will not be able indefinitely to cope with future challenges.

*The author wishes to acknowledge the kindness of Dr John Duke Anthony and Dr F. Gregory Gause III who made helpful suggestions in the preparation of this chapter.

1 This description is used in Peter J.Vine, et al., *Yearbook of the United Arab Emirates* 1995, London, Planet Publishing Ltd, (1995) p 23.

2 British motivation in creating the council may have been a mix of highminded and more cynical impulses. For an instance of the latter interpretation, viewing the council as a scheme to consolidate British rule by reliance on political power indirectly wielded through the rulers, see A.O. Taryam, *The Establishment of the United Arab Emirates 1950-85,* London, Croom Helm (1987) p 16.

3 Good narratives of the events analysed below can be found in Frauke Heard-Bey, *From Trucial States to United Arab Emirates: A Society in Transition,* London and New York, Longman (1982) pp 336–69; Ali Mohammed Khalifa, *The United Arab Emirates: Unity in Fragmentation,* Boulder, Colorado, Westview Press and London, Croom Helm (1979) pp 19–35; and A.O. Taryam, *op. cit.,* pp 64–196.

4 On the reform movement in Dubai see Rosemarie Said Zahlan, *The Origins of the United Arab Emirates. A Political and Social History of the Trucial States,* London, The Macmillan Press Ltd (1978) pp 150–61.

5 See Heard-Bey, *op. cit.,* pp 336–7 and 360.

6 See for example David Holden, *Farewell to Arabia,* New York, Walker and Company (1966) p 159.

7 See Heard-Bey, *op. cit.,* p 371.

8 On this point see Heard-Bey *op. cit.,* p 362..

9 Khalifa, *op. cit.,* pp 34–35.

10 See Heard-Bey *op. cit.,* p 375 and Muhammad Saleh Al Musfir, *The United Arab Emirates: An Assessment of Federalism in a Developing Polity,* Ph.D. dissertation submitted to the State University of New York at Binghamton (1984) p 112.

11 Alfred B. Prados, with the assistance of Ross Kaplan, *United Arab Emirates: Background and U.S. Relations,* CRS Report for Congress, Washington, DC: The Library of Congress (19 June 1995) p 3

12 Al Musfir, *op. cit.,* p 134.

[13] Al Musfir, *op. cit.*, pp 104–5.
[14] Ibrahim Al Abed and Paula Vine, *Yearbook of the United Arab Emirates*, London, Trident Press (1999) p 58.
[15] For a thoughtful commentary on this phenomenon, especially in the UAE, see Jamal Al Suweidi, 'Arab and Western Conception of Democracy,' in David Garnham and Mark Tessler (eds), *Democracy, War, and Peace in the Middle East*, Bloomington and Indianapolis: Indiana University Press (1995) pp 83–4.
[16] See *ibid.*, p 108 on the attitudes of students at the UAE National University at Al Ain.
[17] See *ibid.*, pp 85 and 88.
[18] 'Sheikh Zayed Will Not Attend the Summit and He Designates the Heir Apparent to Represent the Emirates,' *Al-Hayat*, 18 June 1996.

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The Evolution of UAE Foreign Policy

Peter Hellyer*

Introduction

The foreign policy of the United Arab Emirates has one fundamental goal: the enhancement through its dealings with foreign governments, individuals and organizations of the prosperity, stability, power and independence of the country and its citizens. In this general sense, UAE foreign policy is similar to that of other countries. There are, however, two factors that distinguish UAE foreign policy, both in conception and in execution. First, policy is affected, and to some extent restricted, by a unique set of objective circumstances: the size and composition of its population, its geographical location and its natural resources and wealth. Secondly, since the seven-member UAE federation was established in 1971, it has been presided over by the same leadership, permitting the bringing of an unusual – and admired – degree of both experience and consistency to bear in terms of its foreign policy.

Throughout the last three decades, the continuity and consistency of foreign policy has reflected the perceptions held by the leadership of the world about them and of the best interests of country and people. Choices made in the sphere of domestic policy have also had an impact on foreign policy. This can be seen, for example, in the competing claims for expenditure of the defence budget and economic and social development and in the adoption of the choices of conciliation rather than confrontation as an approach to the resolution of disputes.

This chapter will examine the objective conditions within which the UAE leadership operates and the choices that have been made, in order to show the fundamental characteristics of the UAE's foreign policy.

Objective Conditions

There are several objective conditions which make the United Arab Emirates unique, and these affect its foreign policy, in some ways providing it with options not open to other, less wealthy states, but in other ways restricting its options.

First, the UAE is one of the world's major producers of hydrocarbons. Its proven recoverable oil reserves are estimated at 98.8 billion barrels, the third largest in the world, and nearly three

times those of the whole of North America, while its proven recoverable reserves of natural gas are estimated at 6 trillion cubic metres, the world's fourth largest.[1]

The production of over two million barrels of oil a day makes the country one of the key members of the Organization of Petroleum Exporting Countries (OPEC), while it is also a major gas exporter. Although oil and gas now account for only 30–35 per cent of Gross Domestic Product, (the percentage fluctuating in line with changes in the world oil price), the resulting revenue still gives the UAE one of the highest per capita incomes. This wealth has a direct impact on the country's foreign relations. Other countries both need its oil and gas and desire access to its petro-dollars, whether for inward investment or as payments for their goods and services.

Secondly, situated in the south-east of the Arabian Peninsula, with its northern coastline on the Arabian Gulf and its eastern coast on the Gulf of Oman, the country strategically commands the Straits of Hormuz, through which the bulk of the world's oil exports pass every day. Even if the Straits themselves were closed by the actions of other powers, UAE territory could be used to provide entrance to and exit from the Gulf and the Indian Ocean. Complementing this factor, the UAE is also ideally situated to provide a key transit point for the import and re-export of goods, not just within Arabia, but in the whole north-western arc of the Indian Ocean and, overland, into the emerging economies of Central Asia. In recent years, Dubai, the UAE's commercial centre, has become the region's leading entrepôt. Thus the accident of geography has made the UAE of significance well beyond its borders.

While the country is rich in reserves of oil and gas, however, it has few other natural resources. Although, as a result of a cautious and successful policy of investing much of its oil revenues, the UAE has foreign reserves unofficially estimated at well over US $150 billion, use of these to finance current expenditure is tightly restricted. In consequence, the country's prosperity is heavily dependent on fluctuations in the international oil market, although it is better equipped to cope with a period of low oil prices than any other major producer.

Moreover, the UAE's population is small in comparison with many of its neighbours, both in the Arabian Gulf and in the broader area of the north-west Indian Ocean. Its wealth and size are also important factors in the formulation and execution of its foreign policy.

UAE Interests and Priorities

The interests and priorities of the United Arab Emirates in foreign policy derive from these conditions, but they also reflect the views of the country's leadership.

First, the key priority, naturally, is that of seeking security and stability within the immediate region of the Arabian Gulf, including both the states of the peninsula and the two other littoral states, Iraq and Iran. Continued tension in the area over the last 30 years, including two major armed conflicts, has left the UAE with no choice but to focus on affairs close to home.

It has done so within the framework of its second key priority, which is the promotion of close ties with the other states of the peninsula, with whom it shares religion, history, language, culture and tribal and other affinities, as well as systems of government (with the exception of Yemen). The outcome of these affinities, sufficiently strong to override the real differences that do exist, has been the creation of the (Arab) Gulf Cooperation Council (GCC). This body, officially established at a summit held in the UAE capital of Abu Dhabi in 1981, represents

to a very considerable degree the implementation by its members of a common approach to the challenges posed by tensions emanating from elsewhere in the Gulf.

The Arab identity of the United Arab Emirates is also of importance. It is reflected in the country's approach towards the rest of the Arab countries of the Middle East and North Africa, with whom the promotion of relations represents a third main foreign policy priority. Intimately related with this, of course, is the Israel–Palestine conflict, perceived as an issue of dispossession, as well as one of territorial occupation and the violation of basic human rights.

A fourth strand in the country's foreign policy derives from a feeling of identification with fellow Muslims around the world. This can be detected both in the country's extensive programme of development assistance and emergency aid and in the concern shown when fellow Muslims are perceived as being ill-treated by others. This was demonstrated particularly clearly in the cases of Afghanistan in the 1980s and Bosnia and Kosovo in the 1990s.

These priorities, apart from the first one of simple self-defence, reflect the impact of the commonly held beliefs and value systems of the leadership and the people of the UAE. These may be briefly summarized as a sense of Arab identity, a belief in Islam, and, arising directly from the latter, an underlying unselfish and humanitarian approach.

Beyond these, however, the UAE's foreign policy interests also reflect its economic interests. The securing of stable long-term customers for its oil and gas exports, the identification of safe destinations for its foreign investments and the stimulation of trade in order to strengthen the country's position as a commercial entrepôt are all concerns that influence foreign policy. The logic of the international economy also dictates that the UAE's major commercial partners include countries which are not only themselves concerned to support the stability and security of the Emirates, but are also able and willing to provide the means to this end, through defence agreements and arms sales. Thus the development of relations with the Western industrialized nations has long been a key component of UAE foreign policy. In recent years, emphasis has also been placed on the development of commercial and political links with Russia and other successor states of the Soviet Union.

Finally, the formulation and practice of the UAE's foreign policy reflects the recognition that the country's size and location require it to work, wherever possible, in collaboration with others. Both in the bi-polar world that existed until the collapse of the Soviet Union and in the uni-polar world that has since emerged, the UAE's foreign policy has reflected its belief in the necessity of supporting and working with and through international organizations, whether regional, such as the League of Arab States, or global, like the United Nations and its specialized agencies. The pursuit of consensus, conciliation and cooperation is fundamental through the sphere of foreign policy, as, indeed, it is in the domestic sphere.

Continuity in Style and Substance

The federation of the United Arab Emirates was formally established on 2 December 1971, bringing together seven emirates which had previously been in treaty relations with the United Kingdom and were known as the Trucial States. The Constitution, initially provisional, but adopted as permanent in 1996, provides for the highest authority in the country to be the Supreme Council of Rulers of the emirates, Abu Dhabi, Dubai, Sharjah, Ra's al-Khaimah,

Ajman, Umm al-Qaiwain and Fujairah. The Supreme Council is declared to be ultimately responsible for foreign policy.

In practice, however, the rulers have agreed since 1971 that the formulation and execution of foreign policy should be undertaken by the President, Sheikh Zayed bin Sultan Al Nahyan, although their views and interests, and those of their emirates, are, of course, part of the overall equation. Also ruler since 1966 of Abu Dhabi, the UAE's largest oil producer, Sheikh Zayed was a key architect of the federation and was elected by his Supreme Council colleagues as its first President, a post to which he has been re-elected at successive five-yearly intervals. In consequence, there has been a consistency in the determination and guidance of UAE foreign policy over a period of some three decades, something that is decidedly unusual in the volatile Middle East. The wealth of experience gained by Sheikh Zayed over the period has been matched by a steady growth in his own reputation as a statesman, and his views are widely sought after, such that the UAE's own international status is enhanced by the reputation of its President.

President Sheikh Zayed has stamped his own distinctive style on the foreign policy of the UAE Government, as well as on its domestic policy. Instinctively a conciliator and a peace-maker, and with a long record of being prepared to utilize the resources at his disposal for the benefit not only of the people of the Emirates, but also for those in need elsewhere, he is, at the same time, a stout defender of the rights of those he feels to be disadvantaged or dispossessed. Charismatic and determined, with over half a century of experience in government, Sheikh Zayed derives his ultimate legitimacy as President and ruler from the respect and support he has won from his people.

It is important to note that, while the continuity in UAE foreign policy that has been evident since 1971 may be most immediately recognizable through the person of the President, its most visible exponent, it reflects an underlying broad national consensus. Both published and oral evidence suggests that foreign policy is not a topic of serious adversarial debate within the Emirates.

In the years since the UAE was established, a national ethos has emerged in both domestic and foreign policy that resembles closely the style and beliefs of the President himself. Insofar as foreign policy is concerned, this ethos has the following basic characteristics.

Firstly, the UAE seeks to avoid rushed or impulsive decisions. Issues and options are carefully reviewed before action is taken. Moreover where inaction or silence are perceived as being in the country's best interests, such an approach is adopted even if the UAE's friends or allies might prefer a different approach. Action for the sake of being seen to act, or statements for the sake of mere public effect, is disdained.

In general, the UAE adopts a policy of promoting conciliation, cooperation and consensus, seeking, wherever possible, to defuse confrontation and conflict. Although most clearly enunciated by the President, the basic elements of this approach, which is also visible in domestic policy, can be traced back to the nature of the country itself. Society in the Emirates is essentially tribal in nature, although in recent decades an overlay of modern development and administrative structures has partially obscured this fact. Tribal society in the Arabian Peninsula, heavily influenced by Islam, is essentially communal, requiring consultation and consensus in order to be able to survive. The dictum crudely enunciated by former British Prime Minister Sir Winston Churchill that 'Jaw-Jaw (talk-talk) is better than War-War' is equally apt as a description of UAE domestic and foreign policy.

At the same time, however, the UAE has shown that it is quite prepared to act swiftly when the situation requires, and to stand alone on controversial issues if the country's foreign policy establishment believe that it is right to do so. In August 1990, following the Iraqi invasion of Kuwait, the UAE was among the first Arab states to support a swift international military response. Later in the decade, however, the UAE adopted an approach that was clearly distinct from that of its GCC colleagues on the issues of continued United Nations sanctions against Iraq and on opening the way for it to be accepted back into the broader Arab fold.

Thirdly, in line with its generally conciliatory philosophy, the UAE tends to be tolerant of different lifestyles and approaches as long as these do not threaten the basic values of the country and its people. Indeed, as President Sheikh Zayed has stated, Islam is a religion of tolerance, not of intolerance, where the holding of different views is recognized as a right.[2] This is particularly visible in UAE domestic policy. As stated earlier, a majority of the population of the country are not citizens, but temporarily resident expatriate workers. Many are from countries whose social and political norms, values and customs and religious beliefs differ radically from those of the traditional and conservative Muslim society of the UAE.

Within the country, all may practice their customs and beliefs without hindrance, provided that these do not conflict openly with prevailing national norms. Thus while Islam is the national religion, Christian churches can be found in the major population centres, often built with government assistance. Muslim dietary rules are not applied to non-Muslims. One basic, though unstated, pre-condition of this tolerance, however, is that expatriate communities must recognize that disputes between their countries of origin will not be permitted to spill over into the UAE. The two largest communities are Indians and Pakistanis, but, despite the conflicts between those states, it is rare that there is any evidence of tension between the communities residing in the Emirates. Such an approach in domestic policy has implications for foreign policy as well. Thus India and Pakistan, two large and important neighbours with whom the UAE maintains close and friendly relations, have also sought to ensure that their disputes are not echoed among their communities in the UAE.

At a more general level, the belief in tolerance, coupled with a firm opposition to extremism, particularly of a religious origin, can also be traced clearly in the UAE's foreign policy. Sheikh Zayed has, for example, been one of the most active among Muslim leaders in calling for a dialogue between Islam and Christianity as well as in condemning extremists using – or misusing – religion. The relevance of religion to UAE foreign policy is clearly indicated in its position on the future of Jerusalem. Thus Minister of State for Foreign Affairs Sheikh Hamdan bin Zayed Al Nahyan noted in mid-2000 that 'Jerusalem is not only an issue for the Palestinians and Arabs, but is a sacred place for all revealed religions' (i.e. Islam, Christianity and Judaism).[3]

Another factor that is of importance in the determination of the UAE's foreign policy is its structure as a federal state. Under the terms of the Constitution, the conduct of foreign policy is the prerogative of the Federal Government. At the same time, however, the individual emirates may have interests of their own that impinge on foreign policy, and which are taken into account in policy formation. These may include, for example, commercial relations or border issues, while two of the emirates, Sharjah and Ra's al-Khaimah, have a direct interest in a long-running dispute with Iran over the latter's occupation in 1971 of three UAE islands.

Finally, over the last three decades, the United Arab Emirates has become a major donor of development assistance and emergency relief aid. While there is no formal connection

between the financial assistance and political issues, the reputation of the UAE as an important donor state does have a significant impact upon its standing in the international community. Much of the assistance is given on state-to-state level, or through support for the programmes of international agencies, such as the International Committee of the Red Cross, to which the UAE is one of the leading donors.

The Conduct and Evolution of UAE Foreign Policy

The implementation of the foreign policy of the United Arab Emirates takes place within the objective conditions and interests described above. The way in which it is carried out is best examined on a geographical basis, beginning in the immediate region. It should, however, be noted that both the conduct of foreign policy and its geographical perspective have not been static over the course of the last three decades. While this can, to a considerable extent, be ascribed to the necessity to adapt to a changing global community, (such as in the aftermath of the collapse of the Soviet Union), it also reflects a growing confidence. By 1999, for example, the UAE was actively engaged – in a military as well as a political sense – in the conflict in former Yugoslavia, while relations with South Africa were surprisingly close, given its distance from the Emirates and the fact that the two states apparently had little in the way of common interests. Neither region was significant in terms of the UAE's foreign policy initiatives even a decade earlier. UAE foreign policy has, therefore, not only responded to changes in the international environment, but has also been prepared to take new initiatives as a result of the growing organizational and political maturity of the state itself.

The origins of UAE foreign policy can be traced back to the period prior to the establishment of the state in 1971. Under the terms of the various agreements between the seven states and Britain, in particular the so-called 'Exclusive Agreement' of 1892, the rulers of the emirates assigned to Britain the right to represent them in their foreign relations. This, however, never resulted in a severing of traditional relations with other states in the region, while, from the 1950s onwards, following the British withdrawal from India and a consequent lessening of the UK's direct involvement in the area, those states of the Gulf that were still in treaty relations with Britain, including the emirates, began to revive their active involvement in foreign affairs. Thus, for example, Sheikh Zayed visited Jordan in 1968, on which occasion he met for the first time with Palestinian leader Yasser Arafat, while Abu Dhabi also developed relations with Kuwait and, further afield, with Egypt.

The evolution of UAE foreign policy in the first years of the federation derived directly from the foundations laid before 1971, and contributed, *inter alia*, to the early focus on regional affairs.

The Gulf Cooperation Council States

Relations with the five other member states of the Gulf Cooperation Council (GCC) have been a central feature of UAE foreign policy, pre-dating the formation of the Council itself in 1981. The commonality of history, language, culture and other factors has already been referred to. As the UAE's nearest neighbours, along with non-Arab Iran, these states are, naturally, of major importance to the Emirates.

Kuwait, Oman, Bahrain and Qatar all shared with the seven emirates a common history of a close relationship with the United Kingdom. Indeed the agreements between Britain and Qatar and Bahrain were virtually identical to those with the component emirates of the UAE. When, in February 1968, Britain announced its intention of leaving the Gulf by the end of 1971, UAE President Sheikh Zayed, then only ruler of Abu Dhabi, and his colleague Sheikh Rashid bin Saeed Al Maktoum, ruler of Dubai (and UAE Vice-President from 1971 to 1990), took the initiative in launching a campaign for a federation between the states of the lower Gulf. This initially included Qatar and Bahrain as well as the seven emirates, and it was not until the summer of 1971 that the former decided to opt for a separate international status. When they did so, Sheikh Zayed stated (and subsequently reiterated) that the door remained open for Qatar and Bahrain to join the federation if they wished to do so. Although they did not, it is arguable that the way in which the UAE successfully established itself as a federation in the 1970s helped to pave the way for the formation of the larger, looser GCC in 1981.

A focus on good relations with Oman also predated the formation of the federation. Abu Dhabi and Oman had collaborated during the 1950s in their response to a border claim from Saudi Arabia (see below), while the first agreement on their mutual borders was signed before 1971. With Kuwait, further away, relations in the period immediately prior to federation were less intimate, although Kuwait was a major contributor to the Trucial States Development Fund and financed many of the UAE's first schools, while Kuwaiti leaders played an active and constructive role in the negotiations between the emirates that led up to the establishment of the UAE.

Relations with Saudi Arabia in the pre-federation period were more complex. Unlike the rest of the members of the GCC, Saudi Arabia had no special historical relationship with Britain. At the same time, Saudi Arabia claimed territory that was traditionally part of Oman and Abu Dhabi, in particular in the west and south of Abu Dhabi and in the oases of Al Ain, part of Abu Dhabi, and Buraimi, part of Oman. Efforts by Saudi Arabia to enforce its claim had led to a rupture of diplomatic relations between Britain and Saudi Arabia in the 1950s.

While Saudi Arabia welcomed the British announcement of its plans to withdraw from the Gulf, it declined initially to recognize the federation of the United Arab Emirates, pending a resolution of the territorial issue. An early foreign policy priority for President Sheikh Zayed was, therefore, the ending of this border dispute. In 1974, following an exchange of visits, an agreement was initialled which involved, *inter alia*, the cession by Abu Dhabi of some territory in the west of the country to Saudi Arabia. Diplomatic relations were established and in subsequent years, while territorial issues have on occasion affected relations between the UAE and its two landward neighbours, they have not prevented development of relations in other spheres. By the end of 1999, the country's land borders had been effectively agreed and demarcated.

The immediate impetus for the formation of the GCC was the Iranian revolution of 1979 and the subsequent outbreak of war between Iran and Iraq the next year. Relations with Iran had already been adversely affected by the Iranian occupation, in 1971, of the UAE islands of Greater and Lesser Tunb, part of Ra's al-Khaimah, and by the imposition on Sharjah, by threat of force, of an unequal Memorandum of Understanding that allowed an Iranian military presence on a third island, Abu Musa.

Statements issued at the time of the creation of the GCC specifically stressed that it was not a political or military alliance, but rather one concerned with economic issues, an approach that was presumably designed, in part, by a simple desire for caution while a major military

conflict was raging in the immediate neighbourhood. Over the two decades since it was established, however, the GCC has made considerable progress in a wide range of fields. In the spheres of foreign policy and defence, this has taken place particularly since, and in response to, the invasion of one of its members, Kuwait, by Iraq in 1990. Progress in the economic sphere has been slow but steady, with the UAE actively working for an improvement of links between member states and for a lowering of the tariff barriers between them.

Despite the closeness of its relations with its GCC partners, the UAE has on occasion taken a distinctively separate approach as a result of differing political and economic objectives. Thus at the December 1996 GCC summit meeting, the UAE declined to agree to proposals backed by other members for the introduction of a common tariff policy. This would have meant an increase in tariffs, with a consequent adverse impact upon the country's vitally important import and re-export business. Not until late 1999 was an agreement finally reached, which was deemed by the UAE to offer a better protection of its interests.

On occasion, the adoption of a separate stance by the UAE has reflected the distinct moral principles of its leadership, rather than a calculation of political interests. Thus in the late 1990s, the country took a lead in calling for a re-assessment of United Nations sanctions against Iraq, despite opposition from its GCC partners, humanitarian concerns about the plight of the Iraqi people overriding more purely political considerations. Humanitarian concerns also provided the fundamental impetus of the UAE's approach to the crises in Bosnia and Kosovo, caused by the impact upon local Muslims of Serb actions. Further details can be found below, in the sections dealing with these aspects of foreign policy.

Iraq

Since the establishment of the UAE in 1971, its policy towards Iraq has undergone significant changes. From the outset, the UAE sought to establish cordial relations with Iraq, not only a fellow member of the Arab League, but also the most powerful Arab state in the Gulf, as well as being a fellow member of the Organization of Petroleum Exporting Countries (OPEC). Indeed, relations pre-dated the formation of the federation in the sphere of oil policy, since Abu Dhabi, the largest UAE producer, had joined OPEC several years earlier – an important example of the way in which activity in foreign affairs pre-dated the formation of the federation. Abu Dhabi later yielded its own membership in favour of the federation.

While ties were built up with Iraq, however, they never became as close as those with other Gulf Arab states, because of the radically different nature of the Iraqi political system. Indeed, in the early 1960s, Iraq had questioned Kuwait's right to an independent existence following termination of the latter's treaties with Britain, while in the late 1960s, opposition movements in a number of other Gulf Arab states received covert support from Baghdad. At the same time, however, the UAE, like other Gulf Arab states, saw Iraq as a counterweight to non-Arab Iran, whose relations with the Emirates were adversely affected by its occupation of UAE islands immediately prior to the establishment of the federation.

When the Iran–Iraq war began in 1980, the UAE remained formally neutral, although political support was given to Iraq through the framework of the Gulf Cooperation Council. The 'tanker war' which flared up in 1983 between the two warring parties caused considerable alarm in the UAE because it threatened to harm the country's oil exports, and did, in fact, spill over into some damage to UAE offshore installations, helping to reinforce the UAE's sympathy for Iraq.

After that conflict ended, in 1988, ties with Iraq remained friendly until early in 1990, when Iraq's President, Saddam Hussein, began a campaign of public criticism of both the UAE and Kuwait over oil policy, in particular their adoption of a production strategy designed to maintain stable prices. Baghdad perceived this, falsely, as being calculated to have an adverse impact on attempts to rebuild its economy after the war with Iran.

As the criticism mounted, particularly against Kuwait, the UAE, unlike other states in the region, as well as the major global powers, correctly interpreted Baghdad's approach as a threat to regional stability.

Following the invasion of Kuwait on 3 August, the UAE demonstrated its commitment to the GCC principles of collective security. It was among the first Arab states to recognize publicly the necessity for a military response. It joined the United Nations-backed coalition of countries, providing military units to the allied armies and also making its territory available for use by other participants in the coalition, including both Arab and Western countries. UAE ground units were among the first Arab forces into Kuwait in early 1991, while the UAE air force flew numerous sorties in the air war.

Subsequent to the defeat of the Iraqi forces in Kuwait, the UAE stressed its continued support for the sovereignty and territorial integrity of Iraq. It remained, however, committed to the principle of collective security within the GCC states and when, in October 1994, Iraqi troops moved towards the Kuwaiti border, the UAE sent ground forces to Kuwait as a tangible indication of its support.

Unhappy about the impact of sanctions on Iraq, because of the fact that their impact was primarily felt by the people of the country, the UAE acknowledged that the fundamental responsibility for their distress lay with the Iraqi leadership. During the 1990s, the UAE became increasingly uneasy about the continuation of sanctions, however. Four major factors played a part in the emergence of this uneasiness.

First, on simple humanitarian grounds, the UAE was concerned about the suffering of the Iraqi people. Secondly, in the UAE's view, the sanctions themselves were obviously, and increasingly, ineffective. Thirdly the UAE, with its traditional advocacy of conciliation within the Arab world, was concerned about Iraq's continuing estrangement. Finally, the UAE recognized that, whatever current problems may exist, Iraq will remain a major player in Gulf affairs, with a significant role to play and with whom the UAE must deal. On that basis alone, it is in the UAE's interests to take steps to escape from the impasse that prevailed throughout the 1990s.

To tackle the issue, President Sheikh Zayed suggested that an all-inclusive Arab summit be held, prior to which 'the Arabs must open their hearts to each other, and be frank with each other about the rifts between them and about their wounds. They should then come to the summit, to make the necessary corrections to their policies, to address the issues, to heal their wounds, and to affirm that the destiny of the Arabs is one'.[4]

UAE foreign policy with relation to Iraq continued to diverge slowly from that of its GCC partners during the late 1990s, despite implicit criticism from, in particular, Kuwait. While continuing to implement sanctions, the country took steps to provide humanitarian assistance to Iraq, both through the UAE Red Crescent Society and through other means, such as the introduction of a weekly ferry service between Dubai and Basra. In early 2000, the UAE restored diplomatic relations with Baghdad and embassies were re-opened in both capitals.

In August 2000, Deputy Prime Minister Sheikh Sultan bin Zayed Al Nahyan made a first formal call by the UAE for the lifting of sanctions, telling a visiting American envoy: 'The suffering of the Iraqi people has gone beyond the limits of human tolerance. It is high time for the human conscience to move to alleviate the plight of the Iraqi people'.[5]

Iran

Relations between south-eastern Arabia, including the United Arab Emirates, and Iran have been of long standing, and commercial and political links, as well as ties between the two peoples, can be traced back for thousands of years, with the waterway of the Arabian Gulf having facilitated interchange between the two peoples. During periods when Iran has been administered by a strong centralized government, it has tended to adopt an expansionist policy across the Gulf, while when Iran has been weak, south-east Arabian states have extended their influence to the northern side of the waterway.

As the Trucial States moved towards establishment of the United Arab Emirates in 1971, their northern neighbour was unquestionably the most powerful state in the Gulf, the recognition of this being an important factor in the determination of UAE policy.

UAE policy towards Iran has always sought the promotion of cordial ties, the impetus for this not only being a matter of wishing to establish good relations with a powerful neighbour but also being motivated by extensive commercial ties and links between the populations on each coast.

Early attempts to implement this policy, however, were adversely affected by the renewal of territorial claims by Iran to three of the UAE's Gulf islands, Greater and Lesser Tunb and Abu Musa. While these claims had been muted and effectively abandoned for several decades, due in part to diplomatic support from Britain for the two emirates with whom it was in treaty relations, the announcement by Britain in 1968 that it was to leave the Gulf by the end of 1971 prompted Iran's Shah not only to revive the claim, but also to make it clear that he would secure his objectives by force, if necessary. Thus two months before the date set for the British withdrawal, the Shah stated: 'we need them (the islands); we shall have them; no power on earth shall stop us'.[6]

At the end of November 1971, hours before the formal British withdrawal, Iran invaded the Tunbs, killing a number of policemen and expelling the population of Greater Tunb, which fled to Ra's al-Khaimah. In the case of Abu Musa, the ruler of Sharjah was persuaded by the threat of Iranian invasion to sign a Memorandum of Understanding (MOU), under which Sharjah and Iran instituted an administrative division of the island. Neither side relinquished their claim to sovereignty, although the threat of coercion from Iran was in contravention of international law.

The Iranian move was stoutly protested by the newly formed UAE, which promptly arranged to take the issue of the islands to the United Nations, where the Security Council debated and condemned the Iranian action on 9 December 1971.

During the course of the 1970s, the UAE continued to assert its right to the three islands, although without progress in reaching a resolution, since Iran declined to concede that any issue of sovereignty was at stake. Despite this, however, relations with Iran expanded, particularly in the commercial field, while the strong alliance between the Shah of Iran and the United States at least provided some guarantees of regional stability.

This process was interrupted by the success of the Islamic revolution against the Shah in 1979, and, with its northern neighbour in turmoil, the UAE was concerned to insulate itself against the possibility of insecurity in the Gulf. From 1980 to 1988, Iran was primarily concerned with the prosecution of its war with Iraq and fortified the three occupied UAE islands and used them as military bases, this use being in contravention of the Memorandum of Understanding on Abu Musa.

During the 1990–1991 crisis caused by Iraq's invasion of Kuwait, Iran was openly critical of the participation of the GCC states, including the UAE, in the Western-led alliance first to contain Iraq and then to free Kuwait. In the post-war period, Iran stepped up the process of rebuilding its military capabilities, not only obtaining weapons of mass destruction, but becoming the first state in the Gulf to obtain submarines.

In mid-1992, however, the issue of the three occupied islands came unexpectedly to the fore. Iran, which controlled Abu Musa's only useable port, introduced a new rule that anyone disembarking on the island, even persons en route to the UAE side, required Iranian visas. In particular, UAE civil servants, such as teachers, were refused landing permission.

The step, which was clearly in contravention of the Memorandum of Understanding, was viewed by the UAE as evidence of an Iranian intention to extend control over the whole island, particularly in view of a continuing programme by Iran of building military and administrative installations on the island. Responding quickly, the UAE sought and obtained diplomatic support from the GCC and the League of Arab States and, after a short while, the Iranians backed down.

Subsequent years saw a significant change in UAE policy on the issue of the islands. Whereas prior to 1992, the Government of the Emirates was content to restate its right to ownership of the three islands in international bodies, in order to ensure that the issue remained on the world agenda, it now embarked upon a proactive approach, emphasizing its claim to sovereignty, and seeking support from other countries both multilaterally and through organizations such as the United Nations, the League of Arab States and the Organization of the Islamic Conference. By the end of the 1990s, the UAE had won overwhelming support from the international community for its desire that the issue be resolved.

The UAE has consistently emphasized that it will pursue its attempt to regain the islands only through peaceful means. While confident of the legitimacy of its claim, the UAE has put forward two suggestions on ways to bring the dispute to an end. In late 2000, these had yet to make any progress.

The first was that of direct bilateral negotiations with Iran on the issue of sovereignty, offered with no pre-conditions except that agreement should first be reached on a time limit for the discussions. This approach foundered on the Iranian refusal even to acknowledge that an issue of sovereignty existed, despite the fact that its control of the islands was founded in the military occupation of 1971.

The second option reflects in the eyes of the UAE Government both its respect for the principles of international law and its desire that the issue no longer be permitted to impinge on the development of its relations with Iran.

This option is that the issue of the ownership of the islands be judged either by international arbitration or by reference to the International Court of Justice (ICJ). In making this proposal, the UAE declared that it would accept any ruling to emanate from this process as binding.

Iran declined to accept this suggestion, although it had itself suggested this approach after the First World War, when the government in Tehran first began to claim all three islands. International arbitration or reference to the ICJ can only be effective if both parties are in agreement. In consequence, in the UAE view, a resolution of the dispute can now be achieved only when there is a change of policy in Iran.

The election of President Khatami in Iran in 1998 was followed by attempts by Iran to improve relations with the GCC states. These attempts caused some concern in the UAE that the issue of the islands might be pushed aside. Following extensive diplomatic consultation with the other GCC states, however, there was a re-affirmation of the long-existing policy that an improvement of relations with Iran should await signs of progress in resolving the dispute. At the December 2000 GCC summit, the (GCC) Ministerial Council was assigned the responsibility of exploring all peaceful means to bring about the end of the occupation, thus making the issue one of relations between the GCC and Iran, rather than simply UAE and Iran.

Evidence of a change in policy was still lacking by late 2000, with Iran continuing to develop its installations on Abu Musa and still declining even to concede that an issue of sovereignty and occupation was involved. The UAE has continued to assert its desire for a peaceful solution to the problem and to suggest either bilateral negotiations or international arbitration or adjudication. There was, however, little sign of a concrete change in the Iranian approach, with the government in Tehran still declining to acknowledge the existence of any issue of sovereignty and continuing to strengthen its physical presence on the islands themselves.

The Arab world and the Islamic world

Further afield than the Arabian Gulf, the maintenance of solidarity within the Arab world as a whole is an important tenet of UAE foreign policy. In the process of policy formulation, the UAE Government seeks wherever possible to take into account issues deemed as being of significance for the whole of the Arab world, consulting with other Arab governments where appropriate.

Thus while issues directly affecting the Gulf remain central to UAE policy, the broader issue of the Arab–Israeli conflict and the future of the Palestinian people is also of major significance. Links were established by Abu Dhabi with Jordan in the early 1960s, prior to the formation of the UAE, which provided important support, including the seconding of personnel for the establishment of the nucleus of the UAE's armed forces; later in the decade links were also established with the Palestinians.

Although distant from the area of direct conflict, the UAE perceived the Israel–Palestine issue as a matter that directly impinged upon its interests, both its support for the broad concept of Arab nationalism and its support for the principles of the defence and restoration of human and civil rights. The occupation of the Arab land of Palestine was, of course, something of particular interest to the Emirates, which also had part of its territory occupied by a foreign power.

Recognizing the paucity of its own human resources, the UAE did not participate with military units in the most recent of the Arab–Israeli wars, in October 1973. It did, however, play an important economic and political role through its initiation of an embargo by Arab oil-producing states on the supply of oil to countries perceived as being aligned during that conflict with Israel. At the time, the rationale of the embargo was defined by

President Sheikh Zayed as being intended to show that 'Arab oil is not dearer than Arab blood,' or that a loss of oil revenues was a small price to pay when other Arab countries were suffering heavy human losses.[7] Although the initiative led directly to a major increase in oil prices and the emergence of the Organization of Petroleum Exporting Countries (OPEC) as the key determinant of prices, this was a by-product of the initiative, rather than its original objective.

The UAE also became a major contributor of financial aid to the Palestinians and to the Arab front-line states of Egypt, Syria and Jordan, the aid being disbursed both through the Abu Dhabi Fund for Arab Economic Development (ADFAED), later renamed the Abu Dhabi Fund for Development (ADFD), and through direct bilateral government channels.

Throughout the 1970s and 1980s, the UAE supported the Arab consensus on the Palestinian issue. Thus, despite its close ties with Egypt, it broke diplomatic relations with Cairo following the visit to Jerusalem by President Anwar Sadat and the subsequent peace agreement in 1979, although it was later to be among the first of the Arab states to call for a re-admission of Egypt into the broad Arab fold.

Support for the Palestinians per se has also been a significant component of UAE policy since the establishment of the federation in 1971. Implementation of this policy has, of course, evolved in response to changing circumstances. Having initially supported the Palestinian Liberation Organization (PLO) in its confrontation with Israel, the UAE later extended its backing to the process of negotiations between Israel and the Arab states and the Palestinians that commenced in Madrid in October 1991 and out of which later emerged the Oslo Accords. In so doing, the UAE made clear its support for the principle of 'land for peace' and for the implementation of a solution in accordance with international legitimacy.

While many Arab states, including the UAE, had reservations about the concessions made by the Palestinian leadership in the Madrid and Oslo agreements, the UAE noted that since the PLO was internationally acknowledged as the legitimate representative of the Palestinian people, it was for that leadership to determine its own course. This approach was to prevail throughout the 1990s. Only on the issue of Jerusalem did the UAE elaborate its own view, emphasizing that the future of the city should take into account not only its territorial status but also its status as a city holy to Muslims and Christians.

On the wider question of the establishment of normal relations between Israel and the Arab states, the UAE has adopted a clearly distinguishable approach. Both Jordan and the Palestinians reached agreements with Israel in the period 1991–1995, following Egypt in bringing to an end the state of hostilities. In association with this process, the United States exerted diplomatic pressure on other Arab states to normalize relations with Israel, and, in particular, to cease implementation of the Arab economic embargo on Israel and on companies dealing with it.

At a meeting in 1994, the GCC states, including the UAE, agreed to suspend the secondary and tertiary aspects of the boycott, but declined to lift the primary boycott, that of a ban on dealings with Israel itself. Subsequently Qatar and Oman made steps towards a cessation of the primary boycott. The UAE, however, declined to do so, insisting that a full normalization of relations must await the conclusion of a satisfactory overall peace agreement between Israel and all its neighbours, including a just and lasting resolution of issues relating to the Palestinians, including the right of return of the refugees and the establishment of an independent, sovereign

Palestinian state with Jerusalem as its capital. Thus when, in 1998, Qatar hosted an international economic conference designed to promote links between the Arab states and Israel, the UAE Government openly opposed the conference, declined to participate and instructed UAE commercial organizations not to attend.

More broadly, since 1971, UAE foreign policy towards the Arab world has focused, wherever possible, on the resolution of inter-Arab differences and on working for a consensus approach. This reflects to a considerable extent the personal philosophy of President Sheikh Zayed who has offered his own good offices as a conciliator and mediator on a number of occasions with some success. This approach, it should be noted, does not imply a belief in an unattainable unanimity of policy. Thus Sheikh Zayed has openly called for amendment of the charter of the League of Arab States in order that majority decisions can be taken. Nor has the approach meant that the UAE has overlooked actions by other Arab states which it believes to have impinged directly on its own national interests. The support perceived as being offered by Jordan, Yemen and Sudan to Iraq at the time of the 1990–1991 Gulf conflict, for example, led to a freezing of relations for some time, although by the mid-1990s, they began once again to become warmer.

Finally, the UAE leadership has consistently offered support to fellow Arab leaders faced with violence emanating from fundamentalist religious groups, although the UAE itself has fortunately been spared from this phenomenon. Describing such groups as 'terrorist', Sheikh Zayed has noted: 'These people have nothing whatsoever that connects them to Islam. They are apostates . . . We see them slaughtering children and the innocent. They kill people, spill their blood and destroy their property, and then claim to be Muslims'.[8]

UAE foreign policy has involved the recognition of a Muslim dimension to international affairs beyond the Arab world, and the country has been an active participant in the Organization of the Islamic Conference (OIC) and its associated agencies. This began in the 1990s to become a significant factor in foreign policy formulation, although it should be noted, *inter alia*, that President Sheikh Zayed has been more vocal than any other Muslim leader in calling for a dialogue between Islam and Christianity. Thus UAE diplomacy became actively engaged in issues relating to conflicts in the former Yugoslavia, (see below). It also actively demonstrated its concern for the suffering of fellow Muslims in Chechnya, during the conflict in the late 1990s that resulted from the Chechen attempt to secede from the Russian Federation, dispatching humanitarian assistance to the Chechens.

The UAE's involvement, in accordance with the humanitarian aspects of its foreign policy, was additionally stimulated by its belief that the international community was displaying double standards by failing to take action to alleviate the sufferings of the Bosnian and Chechen Muslims while condemnation swiftly followed upon any attack by Muslim Arabs and Palestinians against Israel.

Following the dissolution of the former Soviet Union, the UAE developed increasingly close relations with the Muslim states of Central Asia, including Kazakhstan, Tajikstan, Kyrgyzstan, Turkmenistan, Uzbekistan and Azerbaijan. These relations included both the development of bilateral trade and UAE investment, both public and private. More generally, however, while displaying sympathy for fellow Muslims, by mid-2000 the Emirates' foreign policy showed little sign of a specifically Muslim content.

South Asia

South Asia, broadly defined as the countries of the Indian subcontinent and Afghanistan, has a special place in UAE foreign policy, both for economic and political reasons, particularly with relation to India and Pakistan. Moreover, from 1820 until 1947, British relations with the Trucial States were administered through the imperial government of India.

Links between the Gulf and the subcontinent can be traced back for around 5000 years, with evidence of extensive trade between the Gulf coast and the Harappan civilization of the Indus Valley, while in the period prior to the discovery of oil, India and Pakistan were the key trading partners of the emirates of the southern Gulf coast.

While seeking to maintain good relations with both states, the UAE has also recognized that relations between the two have the potential to cause insecurity within the north-west Indian Ocean, most recently in connection with the dispute over Kashmir and the detonation by both countries of nuclear devices in 1998.

The UAE Government has also paid close attention during the 1980s and 1990s to the situation in Afghanistan, although the conflicts in that country have prevented the development of relations. The UAE offered political support to the insurgency against the Soviet-backed Communist regime, which collapsed in the aftermath of the dissolution of the Soviet Union and was one of the few states to grant recognition to the Taliban administration that emerged out of the subsequent civil war, on the basis that it controlled around 90 per cent of the country's territory. The UAE was thus able to offer itself as a means of diplomatic communication with the otherwise largely isolated Taliban.

Beyond the Region

Beyond the region, relations with Britain have played an important part in UAE foreign policy, because of the historical relationship between the two countries, and because of the involvement of Britain in negotiations leading to the creation of the federation. Indeed, as mentioned earlier, the terms of the 1892 Exclusive Agreement between Britain and the rulers of the individual emirates specifically stated that the former would be responsible for the foreign relations of the latter.

The establishment of the UAE in 1971 coincided with the withdrawal of Britain from 'East of Suez', the culmination of a gradual process that had begun with the independence of India and Pakistan, and Britain's privileged political, military and commercial position in the Arabian Gulf faded as other major industrial powers, in particular the United States, France and Japan, expanded their involvement in the region.

This process was stimulated by two important factors. First, the explosion in world oil prices that followed the 1973 Arab–Israeli war prompted the UAE, and other Gulf states, to embark on a major programme of economic development that offered considerable opportunities to firms from the industrialized powers. At the same time, there was a recognition abroad of the increasing importance of the OPEC group in the world economy, both as suppliers of crude oil and as the owners of substantial reserves that were invested, and often managed, in the financial markets of the industrialized world.

Questions of regional security then came to the fore with the success of the Islamic revolution in Iran which removed the monarchy in 1979. While, prior to that date, the United States had

been content to rely upon Iran, its strongest ally in the region, the change prompted a more visible military presence both from the United States and from its British and French allies.

During the Iraq–Iran War from 1980 to1988, the 'tanker war' against commercial shipping, carried out by both parties, had a direct impact upon the interests of the UAE because of the reliance of its economy on maritime trade. Whereas during the 1970s, the UAE vocally advocated that the Gulf should be kept free of the presence of military forces from outside the region, during the 1980s the policy changed, reflecting recognition by the UAE of the role played by Western navies in maintaining the freedom of passage for shipping both inside the Gulf and through the strategic Straits of Hormuz.

The process of acceptance of a Western military umbrella as a guarantee for regional security was completed as a result of the 1990–1991 Gulf War, when not only did the UAE participate in the allied coalition that freed Kuwait, but also welcomed Western military forces onto UAE territory. Following the war, defence cooperation agreements were concluded with the United States, Britain and France. All also played a part in the UAE's extensive military procurement programme, with American and French manufacturers winning the largest share.

Relations with the United States, in particular, developed strongly during the latter part of the 1990s, a process facilitated by the gradual movement towards a settlement of the Arab–Israeli conflict. With its strong support for the Palestinians, the UAE continued, however, to criticize the American government for what it perceived as its failure to adopt an even-handed approach on the issue.

While at the end of the 1990s, relations with the United States were probably closer than with any other country outside the Gulf region, the foreign policy establishment of the UAE remained aware that the perception by the United States of its own interests was a central component of this relationship, and that the perception itself might change. In particular, it recognized that a coming to an end of the mutual hostility between Iran and the United States that had commenced in 1979 could have a significant impact on US perceptions of its national interests in the region.

Beyond its relations with individual countries, the United Arab Emirates has, throughout its existence, devoted considerable attention to structures designed to strengthen international collective security, whether through established organizations or through temporary coalitions. In each case, humanitarian issues provided the essential motivation. This aspect of its foreign policy can be traced back to the 1970s, when the UAE provided a contingent for the short-lived Arab Deterrent Force stationed in Lebanon during that country's civil war.

Although its role in international peacekeeping was initially confined to the Middle East, there was a marked change following the experience of the 1990–1991 Gulf War. In the early 1990s, for example, the UAE responded to an invitation from the Secretary General of the United Nations to provide units for the UNISOM II peacekeeping operations in Somalia, which had already received development assistance from the Emirates. Although UAE peacekeeping operations in Lebanon and Somalia were under different umbrellas, both countries were fellow-members of the League of Arab States. Following the disintegration of the former Yugoslavia, the UAE extended its peacekeeping further afield.With only minimal economic ties with the Balkan states, the UAE had previously paid little attention to the region, although Yugoslavia did maintain an embassy in the UAE capital. Following the eruption of the conflict in Bosnia, however, the area rapidly became a focus of UAE foreign policy involvement.

As with Lebanon and Somalia, humanitarian concerns were of major importance. In the case of Bosnia, the perception by the UAE was also that the failure of the international community, in particular Western Europe and the United States, to intervene and the imposition of an arms embargo both on the Serbian government and on Bosnia was permitting the killing to continue. President Sheikh Zayed made impassioned appeals for an end to the killing:[9]

> *It is as if the United Nations has been turned into stone, with no feeling or compassion for the agony of the Bosnian people. We call upon all people with a conscience, those who believe in justice and abhor aggression and unjust wars, to stand up against the horrors being perpetrated against the innocent people of Bosnia–Herzegovina. The world has to move forcefully to put an end to this horrifying tragedy. Governments must move now to enable the people of that besieged country to defend themselves. The right of self-defence is the most basic human and elementary right.*

With no sign of prompt international intervention, the UAE openly announced its intention of breaking the arms embargo, and began to assist the Bosnian government to replenish its military arsenal. This, in turn, contributed to a stabilization of the military situation and to Bosnia's eventual survival. The UAE then provided substantial financial and humanitarian assistance to help the country rebuild.

The UAE's active interest in the Balkans was again stimulated by the conflict in Kosovo, whose autonomous status within Serbia had been abolished in 1989. Early in 1998, the Serbian government launched major offensives against the ethnic Albanian population of Kosovo, who, like the Bosnians, were also Muslims. While again calling for international intervention, the UAE, through its Red Crescent Society, commenced a major programme of humanitarian assistance. This was complemented by the establishment of relief centres in adjacent areas of Albania, where the UAE Armed Forces re-built an abandoned Second World War airstrip to facilitate the flying in of relief supplies.

When in early 1999, forces from the North Atlantic Treaty Organization (NATO) commenced a campaign of aerial bombardment to persuade the Serbian government to cease its offensive designed at expelling the Albanian population of Kosovo, the UAE was among the first non-NATO states to express support for the operation.

Once the bombing campaign was over and Serbian forces had withdrawn, political responsibility for Kosovo was assumed by the United Nations, while peace-keeping operations were undertaken by a special international force, KFOR. The UAE was the only Muslim state to offer to participate in KFOR, as well as being the only country outside NATO, apart from Russia. The commitment, made initially for a two year period, was the first operational deployment of UAE forces outside the Middle East region. Through it, the country demonstrated its willingness to extend its active participation in global issues well beyond its immediate neighbourhood.

Conclusion

A review of the foreign policy of the United Arab Emirates since its establishment in 1971 demonstrates that certain issues and interests have remained central throughout the period. Not surprisingly, several of these are related to the Arabian Gulf region, the preservation of whose

political security and stability is an essential component of the security of the UAE itself.

During that period, the UAE has succeeded in remaining relatively insulated from the impact both of major political changes in the region and of two major armed conflicts.

At the same time, changes in the global arena, in particular the disappearance of the Soviet Union and the emergence of a uni-polar world have had a direct impact on the involvement of other, much larger, powers in the Gulf area.

In response to these changes, the way in which the UAE has pursued its foreign policy interests within the region has itself changed. It is, however, possible to detect throughout the same essential themes identified earlier as the major components of policy. That there has been a broad consistency is attributable to the way in which the country has enjoyed a stable leadership since 1971.

When the UAE was established, its view of international affairs was fairly narrowly confined to the Gulf and the broader Arab region. Gradually, however, its political horizons expanded, a process that markedly accelerated during the 1990s. As a result, by the year 2000, the country was projecting the pursuit of its political interests far further afield than would have been anticipated a few years earlier.

It has been able to adopt this approach with some success, and has, in the process, been recognized as a state with a real, albeit limited, role to play in international affairs, and one which, moreover, is prepared to take concrete action in support of its views. That, in turn, has been of considerable benefit in winning widespread support for its own position on key regional issues.

It is now possible to distinguish a characteristic style in the way in which the UAE pursues its foreign policy objectives. That style has been established by President Sheikh Zayed but now transcends personalities and has become a fundamental component of the nature of the state.

* The structure of this chapter draws to a considerable extent upon a review of UAE foreign policy by William A. Rugh, published, as 'UAE Foreign Policy', in Ghareeb, E. and I. Al Abed. (eds), *Perspectives on the United Arab Emirates*, London, Trident Press (1997) pp 159–175. The debt owed to him is gratefully acknowledged. The author also benefited from access to material prepared by Francis Matthew, Managing Editor, *Gulf News*, for the UAE Ministry of Information and Culture. The author is also grateful to Ibrahim Al Abed, Adviser, UAE Ministry of Information and Culture, for his comments on early drafts of this chapter. A colleague of the author for more than 25 years, he has been invaluable in shedding light on the nuances and processes determining the evolution and implementation of the country's foreign policy.

1 BP Amoco, *Statistical Annual Review of World Energy*, June 2000.

2 'Islam is the religion of tolerance and forgiveness, of advice and not of war, of dialogue and understanding . . . A Moslem should know what are the true teachings of Christianity, and a Christian should know what are the true teachings if Islam. Sincere people from both sides should enter into dialogue, and should not leave the floor to the extremists who are there amongst both Christians and Moslems. A true dialogue between religions is the real deterrent and a strong defence against fundamentalists and extremists.' *Emirates News*, 17 October 1995, quoting a speech by Sheikh Zayed to foreign ambassadors presenting their credentials.

3 Statement by UAE Minister of State for Foreign Affairs, Sheikh Hamdan bin Zayed Al Nahyan, cited by Emirates News Agency, WAM, 5 August 2000 ('UAE extends full support to the Palestinian position').

4 Interview given by Sheikh Zayed to the *New York Times*. Full text transmitted by Emirates News Agency, WAM, 22 June 1998.

5 WAM, 13 August 2000.

6 The *Guardian*, London, 28 September 1971.

7 Cited in *Leadership*: Collection of speeches . . . of HH Sheikh Zayed bin Sultan Al Nahyan, President of the UAE, 1971–1987, Presidential Court, Abu Dhabi (1987) p 187.

8 Cited in Al Abed, I and Vine, P. (eds), *United Arab Emirates Yearbook 1999*, London, Trident Press (2000) p 16.

9 Cited in Al Abed, I and Vine, P. (eds), *United Arab Emirates Yearbook 1999*, London, Trident Press (2000) p 20.

Dimensions of the UAE–Iran Dispute over Three Islands

Mohamed Abdullah Al Roken

Introduction

The current dispute between the United Arab Emirates (UAE) and Iran over the three islands of Greater and Lesser Tunb and Abu Musa is a classic example of the perpetuity of historical disputes. Time may solve many problems, but not those related to the difficult issue of sovereignty and title between states. Legal rights that have been wholly or partly usurped do not disappear with the mere passage of time.

The crisis concerning the three disputed islands is multidimensional. Politically, it reflects the hegemonic attitude of major regional powers (major in terms of population, area and wealth). Economically it highlights the strategic importance of the islands' location as a toll booth to the Straits of Hormuz, controlling the passage of a vital regional commodity, oil, and even jeopardizing the very source of that commodity in a smaller state. Furthermore, the crisis has a historical-legal dimension. Unfortunately, however, this third dimension has not been adequately probed by those concerned with, or interested in, the crisis. This is probably due to the difficulty of research into the quagmire of history and international law, and to the scarcity of references and literature dealing with the dispute. In this chapter I shall deal with different axes indicating the historical dimension of the dispute which support the UAE's rightful title to the three islands and refute Iranian claims thereto. However, I must stress that I am wholeheartedly in favour of a peaceful solution, as strongly advocated by the UAE. The region should be spared the horrors of a further war, and should avoid anything that may unnecessarily drain its human and material resources and upset the regional balance of peace.

Historical Roots of the Dispute

The Arabian Gulf, all its waters, islands and coasts, became a purely Arab 'lake' with the Islamic conquests in the seventh century AD. Even in the periods following the decline of the early Islamic Caliphate, local powers, especially in Oman, maintained control and sovereignty over the region as a whole. The legal status of the islands was closely linked to the legal status of the southern coast area until the presence of the European colonial powers early in the sixteenth century.

The rise of the Qawasim state and apportionment of the Gulf islands

On the fall of the Ya'aruba state in Oman (1624–1741), a new Arab maritime power rose to fill the vacuum. The new power was the Qawasim state based in Ra's al-Khaimah. By the middle of the eighteenth century, the Qawasim fleet was the principal naval power in the Gulf. The Qawasim eventually extended their influence to several regions in the Indian subcontinent and the East African coast. However, their power was concentrated on the southern coast of the Gulf, Ra's al-Khaimah and Sharjah being their major cities. In 1750 a faction of the Qawasim moved northward where they settled down in the area of Lingeh. The settlers eventually established an independent state in that region and sought to extend their influence to the islands and coastal areas of the Gulf.[1]

Historical references point to a sharing of the Gulf islands by the two Qawasim factions: the islands of Sirri and Hengam became the property of the Lingeh Qawasim, while Abu Musa, Greater and Lesser Tunbs, and Sir Abu Nu'air came under the Qawasim of the southern coast (Ra's al-Khaimah and Sharjah). Such arrangements were already in being by 1835.[2]

Thus, the Qawasim of the coastal areas established and maintained unopposed legal and actual sovereignty over the islands. In 1864 their ruler sent an official message to the British Resident informing him that the islands of Abu Musa, Greater and Lesser Tunbs, and Sir Abu Nu'air had been ruled by his ancestors, and would, therefore, remain under his rule. This message was the first document asserting the UAE's legal title to the islands. Sovereignty was further demonstrated in various forms of protest against any intervention in the islands or violation of the agreement by the Lingeh Qawasim or neighbouring emirates. As early as the 1870s, Abu Musa island had become an agricultural centre and a resort for the Qawasim rulers of Sharjah.[3]

This separation of the two Qawasim factions is further confirmed by the fact that in 1873 the ruler of the Sharjah Qawasim, Sheikh Salem bin Sultan, dispatched 50 armed men to Abu Musa to drive away ships belonging to Lingeh Qawasim. Even earlier, in 1871, the sheikh of the Qawasim of Ra's al-Khaimah had denied Lingeh Qawasim entry into the Tunbs. He sent a message to the Lingeh sheikh protesting against unauthorized visits to the islands by his subjects. The Lingeh ruler replied confirming that the islands actually belonged to the Qawasim of the southern coast.[4]

The attitude of the then dominant colonial power (Britain, through the British government of India) was to consider the title to the islands and division thereof between the two Qawasim factions to be a purely local issue in which it had no desire to interfere. However, the British Political Agent, Haji Abdulrahman, who had broad commercial interests with the Lingeh Qawasim, tried to demonstrate, in his correspondence with the British government of India, that the islands belonged to the Lingeh Qawasim. He even ordered the ruler of Ra's al-Khaimah's Qawasim[5] to quit them. However, the ruler of Ra's al-Khaimah stressed, in a message sent in February 1873, that the three islands were under his jurisdiction, and also indicated that Sirri island belonged to the Lingeh Qawasim. In a message from their ruler in 1877, the Lingeh Qawasim admitted that title to the Tunbs belonged to Ra's al-Khaimah Qawasim.[6]

A further proof that the Qawasim of the southern Gulf had title to these islands is that they exercised all aspects of sovereignty over them. In 1879, for example, the ruler of Sharjah, Sheikh Salem bin Sultan, exiled his political opponents to Abu Musa island. When he himself was overthrown by his nephew, Sheikh Saqr bin Khaled, in 1883, he chose to live on Abu Musa himself.[7]

In the late nineteenth century Imperial Iran began to spread its influence to the northern Gulf coast. In 1887, Persian armies invaded Lingeh and expelled the Qawasim governors who had ruled it for over 125 years. The Persians continued their offensive, ultimately occupying the island of Sirri. It is worth noting that in one of his reports, the Commander of the Iranian forces stated that the Qawasim had settled down in Abu Musa, which he regarded as their base.[8]

When Iran occupied the island of Sirri, the Qawasim of the southern coast began to have fears vis-à-vis the territorial ambitions of their northern neighbour. Their fears proved well-grounded when Iran set forth a series of claims to other islands. The British government protested mildly against Iran's occupation of the island of Sirri, while the Qawasim continued to affirm their title to it.[9]

In a note dated 11 March 1888 Britain demanded an explanation for the hoisting of the Iranian flag on the island. The note also asked for evidence of Iranian claims to the island, especially as it was being ruled by the Qawasim in their capacity as the ruling dynasty in Lingeh, and not as Iranian officials. On the same day, the Iranian Foreign Ministry replied saying:

> *. . . It is to be stated that according to all laws of progressive countries, the strongest evidence of ownership (of places and territories) of a government is 'occupation' and 'possession', and hence there is no need for presentation of any other evidence.*[10]

In 1898, the ruler of Sharjah, by virtue of his sovereignty over the island,[11] granted three Arab nationals the first concession to prospect for red oxide in Abu Musa.

Iran claims Abu Musa

Territorial and political ambitions, combined with the economic interests of influential elements within the government, helped strengthen the first Iranian claim to the island of Abu Musa in 1904. Iran began to challenge Sharjah's sovereignty over the island, with its eyes on the island's resources, particularly the red oxide. It thus dispatched a mission, headed by a Belgian officer, to hoist the Iranian flag on the island. The ruler of Sharjah protested against this action, and his reaction was supported by the British Resident. The latter called upon Iran to submit evidence supporting its title to the island. Three months later, Iran quietly withdrew from the conflict, having failed to produce any evidence supporting its claim.[12]

Throughout the period of the British presence in the Gulf, the British Resident kept sending messages to the rulers of Sharjah and Ra's al-Khaimah stressing his country's recognition of their title to the three islands. Moreover, the Political Agent to the Trucial States (as the UAE was called before independence), Sir Donald Hawley, states in his book *Trucial States* that from the beginning of its presence in the Gulf, 'the British Government has regarded the two islands as belonging to the states of Sharjah and RAK (Ra's al-Khaimah) respectively'.[13.]

In 1912, Britain and the ruler of Sharjah agreed to establish a lighthouse on Greater Tunb, with the assurance that this would not entail any encroachment on the ruler's sovereignty over the island.[14] In 1923, the ruler of Sharjah granted a five-year red oxide exploration concession to a British national named Strick. Iran protested against the granting by the ruler of Sharjah of prospecting concessions in Abu Musa. This was followed by a lull in the dispute.

Anglo-Persian negotiations

On 24 August 1928 the British administration issued a memorandum on the status of the three islands. In that memorandum it was stated that the islands of Greater and Lesser Tunbs had belonged to Ra's al-Khaimah since its emergence as an entity independent of Sharjah, while Abu Musa belonged to Sharjah, whose ruler was entitled to the proceeds of exploiting the red oxide and had been for a long period of time.[15] This memorandum was issued following a verbal understanding between the British and Iranian governments in which it was concluded that the three islands were Arab territories.[16]

The period 1929–1930 witnessed negotiations between Britain and Iran aimed at reaching an Anglo-Iranian treaty. During these negotiations, evidence emerged supporting the Qawasim's title to the three islands, and hence highlighting the weakness of the Iranian claims. In the draft of the treaty it was decided to recognize Iran's title to the island of Sirri, while the three other islands (the Tunbs and Abu Musa) would remain Arab.

The negotiations were almost a tug-of-war exercise between the two parties. The Iranian Minister of Court, Mr Taimurtash, expressed in August 1929 his country's readiness to withdraw its claim to Abu Musa, in return for recognition of its title to the Tunbs. Iran then offered to buy the Greater and Lesser Tunbs. In May 1930, Britain referred the Iranian offer to the ruler of Ra's al-Khaimah, in the presence of the ruler of Sharjah. The two rulers, however, strongly rejected the offer, and informed the British Political Resident, Mr Barret, that the two islands were not for sale, whatever the price.[17]

The attempt was repeated in October of the same year when Mr Taimurtash set forth a fresh idea, namely that Iran might lease the two islands for a period of 50 years. This was but a bid to save face in the wake of Iran's bitter failure to claim Bahrain. Britain welcomed the new

idea, as it would have enabled it, in turn, to lease the islands from Iran at the entrance to the Gulf once the lease was in effect. For several months, British officials exerted pressure on the ruler of Ra's al-Khaimah to persuade him to accept the new offer. The ruler eventually agreed, on the strict conditions that the Qawasim flag should continue to be hoisted on the two islands; and that Iran should refrain from inspecting Arab ships and boats, or even from issuing orders to them.[18] In the end no agreement was reached and the islands were not leased to Iran. Thus, all Iranian attempts at expropriating the three islands failed, and Sharjah and Ra's al-Khaimah continued to exercise sovereignty over them.

In 1935, the ruler of Sharjah signed an agreement with Golden Valley Ochre and Oxide Company Ltd, to exploit red oxide in Abu Musa. That company continued to function until 1968.[19] On 6 February 1953, the same company was granted exploration concessions in the Tunbs.

The exercise of sovereignty is further evidenced by the fact that on 3 March 1964, the ruler of Ra's al-Khaimah granted oil exploration concessions in the Tunbs to two companies: Union Oil Exploration and Production Company and The Southern Natural Gas Company. Meanwhile, Sharjah granted similar concessions in Abu Musa and its territorial waters extending 12 nautical miles to Buttes Gas and Oil Company.[20]

Iran raises the stakes and occupies the islands

However, the situation was not uneventful throughout that period. Having failed to annex the island of Bahrain, following a United Nations resolution which endorsed Bahrain's independence on the basis of a referendum that was conducted in 1970, asserting the island's independence and its Arabism, Iran began to claim the three islands again, even more emphatically. The Iranian writer Pirouz Mooojtahed-Zadeh said: 'The Iranians openly and vigorously asserted their claims of Tunbs and Abu Musa islands immediately after the settlement of Bahrain issue'.[21]

The linking between the islands issue and Bahrain is confirmed by British and Iranian documents. The Minister of the Imperial Court, the closest aide to the Shah, Amir Assdollah, stated in his confidential diary on 23 March 1969 that:

> *The British Ambassador called. I told him we can reach no settlement in respect to Bahrain until we know the fate of Tunb and Abu Musa. In that case, he declared, we have all been wasting our time. So be it, I said.*[22]

The British held intensive talks with Iran and the emirates of Sharjah and Ra's al-Khaimah in 1970–1971, through its representative, Sir William Luce, seeking to secure a toning down of Iran's threats to occupy the three islands by force, Sir William Luce set forth several compromise proposals aimed at finding acceptable negotiation terms.[23] The negotiations were overshadowed by aggressive statements by the Shah of Iran, whose prestige had been harshly bruised by failure to obtain Bahrain. In an interview with *The Guardian* published on 28 September 1971 he said, 'We need them (the islands); we shall have them; no power on earth shall stop us. If Abu Musa and the Tunbs fell into the wrong hands, they could be of a great nuisance value'.[24]

By 'wrong hands' was meant at that time the communists and the leftist tide in the Arabian peninsula and the Middle East. The then Iranian Foreign Minister, Ardeshir Zahedi, said in a statement to the press, 'These islands have been ours, and they are going to be ours. There is no compromise. Look at the Chinese communities in Aden. If these islands go, all our interests will be damaged.'[25]

British Foreign Office documents for 1969 (released early in 2000) indicated that the rulers of Sharjah and Ra's al-Khaimah continued to refuse to hand over the three islands, in spite of repeated British and Iranian pressures on them to accept an amicable settlement of the issue; one that would prevent direct military occupation by Iran depriving the two rulers of their sovereignty over the islands. Iran went as far as to send an envoy to the ruler of Ra's al-Khaimah urging him to sign a letter declaring Iran's sovereignty over the two Tunbs. The ruler, however, refused to do so in spite of all Iranian threats and deadlines. Britain had also repeatedly attempted to convince the two rulers to settle the dispute with Iran before its scheduled withdrawal from the region by the end of 1971. Such attempts clearly show that Britain wanted the two rulers to make significant concessions and to depart from the very position it had itself been supporting until 1969, namely the rejection of any bid to give up or to share sovereignty over the three islands. As the released documents indicate, Britain's aim was to prevent the Shah of Iran from seizing the three islands by force before its departure from the region, as such an occupation would involve it (Britain) in an Arab-Iranian confrontation, and thus hamper its plans for an orderly and safe withdrawal.[26] In the meantime, such arrangements would strengthen Britain's ties with Iran at the expense of the Arabs' rights to the islands.

British endeavours ultimately resulted in a Memorandum of Understanding which was signed by Iran and Sharjah on 30 November 1971. Under this agreement, Iranian troops could land on the northern part of Abu Musa. Ra's al-Khaimah, however, maintained its position of rejecting any concessions with regard to its title to the Tunbs. Iran responded to this outright rejection and refutation of its claims by forcibly occupying the two islands in an offensive that claimed the lives of two servicemen and five other citizens from Greater Tunb. The offensive also resulted in the demolition of a police station and a primary school on that island, and the eviction of its citizens, who sought refuge in Ra's al-Khaimah.

Basis of Iranian Claims and their Refutation

Initially it may be useful to refer to certain secondary claims cited by Iran. The first is that 'Tunb' is a word of Persian origin meaning 'hill' and that it is derived from a local Persian dialect known as 'Tangistani Persian'.[27] Apart from the legal invalidity of this evidence, because linguistic derivation is not a criterion for territorial title or sovereignty, it is also linguistically incorrect. 'Tunb' is a purely Arab word meaning 'a long rope used to erect a tent',[28] while the name 'Abu Musa' leaves no doubt as to its being Arabic.

Secondly, Iran claims that the three islands had for a lengthy period of time before the eighteenth century been under Persian occupation. Such a claim is disproved by historical fact. Moreover, the Persian occupation of the three islands lasted for a short while, and occurred as a result of internal conflicts and a subsequent period of weakness in the region. The Persians were soon driven out of the islands. The claim is also illogical in light of contemporary international relations. If such a short period of occupation were to be taken as the basis of proving a state's title to any particular territory, it would result in the undermining of international peace and security.[29]

A third claim cited by Iran is based on geographical proximity. There is no factual basis for this claim, especially with regard to Abu Musa and, in any case, international law (to avoid

repercussions in the realm of international relations) does not recognize geographical proximity as valid evidence supporting territorial claims.[30]

The fourth claim is that the Qawasim had ruled Lingeh in their capacity as 'Persian officials', and hence the islands belonged to Iran.[31] Historical facts refute this claim; the three islands had never been under the rule of Lingeh Qawasim. Throughout the years they had always been ruled by Sharjah and Ra's al-Khaimah Qawasim. Unfortunately, however, many British legal advisers had laboured under such a misunderstanding, drafting legal memoranda for the British government in which it was wrongly stated that the Lingeh Qawasim had exercised control over Greater and Lesser Tunb and Abu Musa. In fact they only ruled the island of Sirri.

Iran's claim to the three islands is based on three major arguments. The first argument is that in terms of international law Iran says it has evidence supporting its claim of title to the islands. The second is that British maps refer to the islands as being under the sovereignty of Iran. The third is that Iran's strategic interests dictate possession of the three islands, so that Iran may be able to safeguard its security in the Gulf.

Let us now consider each of the three arguments and refute them on historical and legal grounds.

Evidence supporting Iran's claim to the islands

First of all, it should be stated that Iranian researchers proceed from a basic hypothesis that the three islands are under Iranian control by virtue of lengthy historical sovereignty. They allege that there was no sovereign state in the Gulf region other than Iran for 2500 years (itself demonstrably a historical fiction) and that Iranian public opinion sees the entire Gulf and its islands as Iranian. Therefore, there is no need to produce evidence for Iranian ownership of the three islands, and whoever claims otherwise has to present contrary evidence.[32]

Furthermore, Iran claims that the three islands had been under its sovereignty until Britain occupied them in the name of the sheikh of Sharjah, and handed them over to him early in the twentieth century. Iranian writers differ as to the exact date of the alleged British occupation. Pirouz Mojtahed-Zadeh says it was June 1903, while Davoud Bavand states that it was April 1903, and Hooshang Amirahmadi claims it was 1904![33]

A story has been fabricated to justify this supposed episode. It states that Britain was concerned over Russian infiltration into Iran, and their possible subsequent arrival in the Arabian Gulf. Thus, it persuaded the ruler of Sharjah (who was under its protection) to claim ownership of Abu Musa island and hoist the Emirate's flag thereupon as a sign of sovereignty over it. Iran did not recognize the resulting occupation of the island until April 1904. Protesting against such a step, it hoisted its own flag on the island, but again lowered it.[34]

Davoud Bavand also constructs theories about what he called an 'Anglo-Sharjah occupation of Abu Musa'. He describes how, in its bid to check Russian and Iranian influence alike, and in order to block Iranian customs from exercising their authority over Gulf islands, Britain ordered the ruler of Sharjah to hoist his flag on the island, thus signifying an unjustified occupation.[35]

The story, however, ignores several facts, the most important of which is the historical correspondence concerning the Qawasim ownership of the islands that pre-dates 1904 by many years. It also ignores all aspects of sovereignty exercised by the Qawasim during the eighteenth and nineteenth centuries and the fact, admitted by Iranian researchers themselves, that Iran did not exercise any real or legal sovereignty over these islands for a long time. The central authority

in Iran had no sovereignty over the remote dependencies and provinces, let alone over islands that had never been under its rule. Thus, an Iranian researcher admits that:

> *. . . Ill-defined relationships between the centre and its autonomous peripheries (principalities and dependencies) . . . resulted in the loss of territories all around the country. Wherever it was asserted that these principalities and dependencies were independent of Iran, Tehran failed legally to and/or physically to disprove this'*.[36]

International law scholars are at one as to the existence of five conventional methods for the acquisition of, or claim to, sovereignty over a given territory. These are: occupation, accretion, conquest, acquisitive prescription, and cession.[37] It should be noted, however, that these methods came into being as justification for imperial European ambitions in the eighteenth and nineteenth centuries. I shall attempt briefly to explain them, and to pinpoint the extent to which each applies to the Iranian claims.

Occupation

By occupation is meant the capturing of 'no-man's land' by a state, with a view to extending its sovereignty over it. For occupation to be effected in this way, three conditions must be met:

- The territory to be thus occupied must be a *res nullius*.
- Occupation should culminate in imposing sovereignty over the occupied territory.
- A continuous and peaceful display of territorial sovereignty.

The basis for occupation has changed in European legal thought with the historical development of colonial expansion. Initially, it was based on a fifteenth century Papal decree; later, it was based on geographical exploration. Eventually, the basis of occupation became the actual acquisition of a territory, provided that other European powers were notified of this acquisition, in accordance with the 1885 Berlin Convention.[38]

Let us now apply this concept to the three islands. Never have they been *res nullius* territory. They have been ruled by the Qawasim for over two and half centuries, as has been recognized by Britain and by Iran itself. Moreover, the acquisition of territory through the occupation method has declined in the twentieth century due to the absence of 'no-man's land' that may be occupied.

Accretion

Accretion means the acquisition by a state of new areas by virtue of natural factors or through human efforts, as when new islands emerge in the state's territorial waters as a result of volcanic activity, or when a state converts part (or parts) of its territorial waters into land.

The geographic reality of the three islands does not qualify either party to claim them on that basis. The three islands have existed in the Gulf since time immemorial, and have never been within Iran's maritime zone.

Conquest

A common practice before the emergence of the new world order, conquest meant the use of force to eliminate the legal existence of a state, or the annexation of a part of it to the invading state. Under contemporary international law, this method has become illegitimate, and therefore cannot be used as valid evidence supporting any claim to any territory.

Paragraph 4 of Article 2 of the Charter of the United Nations explicitly states that:

> *All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or from acting in any other manner inconsistent with the purposes of the United Nations.*

Rejection of this method was practically demonstrated by the international community through international decrees condemning conquest,[39] such as Security Council Resolution No. 242 (1967) which rendered illegal the acquisition of territories through war and invasion, and various Security Council resolutions on the Iraqi occupation of Kuwait.

Iran, therefore, cannot establish its claim to the three islands on the basis of a conquest that occurred in 1971. It cannot legally justify its occupation of Greater and Lesser Tunbs and Abu Musa under international law as conquest, since such a claim to sovereignty will be deemed null and void *ab initio*.

Acquisitive prescription[40]

By acquisitive prescription is meant the laying of hands by a state upon a territory under the sovereignty of another, or the exercising of actual sovereignty over it publicly and uninterruptedly for a period of time without opposition or protest on the part of the latter.[41] Iran, which has been occupying the three islands for over 25 years, may thus base its claim to them on acquisitive prescription. However, acquisitive prescription as defined by international law sets forth certain conditions for a claim to a territory in this way:

- Laying hands upon a territory should be effected through the sovereign party by way of exercising its authority over it. Thus, the leasing of a territory, or administration thereof by a party that recognizes the sovereignty of another over it should not be regarded as a situation granting acquisitive prescription, whatever the duration of the lease or the administration. While administering part of Abu Musa, Iran admits that the issue of sovereignty over the island has not been settled in any way.
- Peaceful acquisition is another condition for acquisitive prescription. Thus, acquisition by force, as is the case with the Tunbs, does not support Iran's claim to the two islands on the basis of acquisitive prescription.
- Acquisition should be public, and uninterrupted over a long period of time. Legal scholars differ as to the specific period needed for acquisitive prescription to occur. Some have suggested 100 years, while others opt for 50. In the case of the Tunbs, longer historically-proven acquisition lies with the UAE, rather than with Iran.
- Submission by the party to which the territory belongs: i.e. lack of protest or opposition to laying hands by another state on the territory. Diplomatic protests and legal action thus undermine acquisitive prescription. Iran cannot, therefore, claim that the UAE has succumbed to a de facto rule over the islands, or relinquished its established title to the three islands. From the first day of the Iranian occupation of the islands, the UAE sought to prove their legal title to them. A message was sent to the United Nations by the emirate of Ra's al-Khaimah on 30 November 1971. Meanwhile, there was armed resistance on the Tunbs and the conflict resulted in some casualties. The UAE continued to defend its rights in United Nations lobbies whenever the issue of the three islands was raised.[42]

Cession

By cession is meant the relinquishing by a state of its sovereignty over some part of its territory to another state through an agreement between both. The basis or mechanism of cession differs on a case-by-case basis. Cession may take place through barter, as in an exchange of territory or part of a territory. Cession may also occur in return for financial compensation, as happened with the acquisition by the US of Alaska from Russia in return for seven million dollars. Finally, cession may occur coercively as when a victor state exercises pressure on a defeated one, eventually forcing it to cede a particular territory or territories.

For cession to hold, or to be regarded as an act transferring sovereignty, the following conditions must be met:

- The ceding state must have actual legal sovereignty over the territory to be ceded. On such a basis, Iran cannot claim that Britain had ceded the three islands to it before the termination of its treaties with the UAE and subsequent withdrawal from the Gulf. Britain was unqualified to do so, simply because it did not enjoy sovereignty over the islands. Meanwhile, the emirates of Sharjah and Ra's al-Khaimah have never ceded their sovereignty over them, notwithstanding the agreement concluded between Sharjah and Iran.
- Cession must occur peacefully and willingly. If effected under the threat of force, it shall have no valid legal consequences and the ceding state shall not be bound by it.
- The object of cession must be sovereignty over the territory in question, not simply the administering thereof.

British maps and their validity

The second consideration on which Iran bases its claim to the three islands is the presence of a British military map presented by the Foreign Office to the Shah of Iran in 1886. This map figures the Greater and Lesser Tunbs and Abu Musa in the same colour as that given to Iranian territories. Thus, Iran claims, the three islands have been under its sovereignty since that time.

Initially, it is necessary to discuss the status of geographical maps under Public International Law, and the extent of their validity as evidence supporting sovereignty rights over territories. Maps are of two kinds: official and private. Official maps are those annexed to international treaties or international arbitration verdicts. These have supplementary value, but do not by themselves create legal consequences. Private maps are those issued by geographical and scientific associations, or by specialized companies, or even by individuals. These lack the testimonial value of official maps.[43]

Iran has pointed out that all the maps then issued by British authorities show the three islands to be part of its territories and that this is shown particularly clearly in the 1886 military map presented to the Shah by the British representative. Iran therefore argues that this map is a valid proof of its title to the islands.[44]

In fact, the said map had first appeared in 1870, in the *Persian Gulf Pilot*. It attaches the three islands to Lingeh. However, it was but a private map, that was not formally part of any border treaty or agreement between Iran and rulers of the Qawasim. It should be noted that this type of map is not binding on the state in which it is issued, let alone on the states concerned. Moreover, this error was later corrected by British officials. Britain regarded

the content of these maps as 'unintended'. The errors, therefore, should not be interpreted as an official statement on the part of the British government concerning ownership of the island. They were insignificant errors.[45]

On the other hand, an earlier map published in 1864 by a German cartographer indicates that the three islands belonged to the southern coast Qawasim.[46] Meanwhile, international maps produced until 1870 referred to the Arab character of the islands. Many subsequent maps also gave clear indications that they belonged to the emirates. Recent maps, including some produced in Iran, also indicate that the Tunbs and Abu Musa are under the sovereignty of the emirates. The most valuable recent example is the map produced in 1955 by a specialized Iranian company indicating that the three islands are not part of Iran, and that they are Arab territories.[47]

The said British map of 1886 cannot be taken as evidence supporting Iran's claim to the three islands. Firstly, that map might at best be interpreted as an implicit recognition of Iran's claim to the islands; but it is a recognition by a third party with neither right nor sovereignty over the islands, *nemo dat quod non habet*. Secondly, Britain itself had, as indicated in our introduction, repeatedly and explicitly recognized in official correspondence the sovereignty of Sharjah and Ra's al-Khaimah over the islands. An implicit recognition whose validity and legal strength is doubtful cannot and should not supercede an explicit one to the contrary.

Iranian strategic interests

Iran recognizes the strategic importance of the three islands in the Gulf. They dominate its entrance and the lanes through which the bulk of Iran's oil exports and its vital imports pass. Therefore, maintaining control over the islands would safeguard Iran strategically and maintain its national security.

This view poses an important question: Does a state's strategic interests justify violation of international rules of law and define its territorial sovereignty? The answer must be in the negative. Whatever the importance of strategic interests, they cannot constitute a valid support for sovereignty over a territory.

Moreover, some scholars see a contradiction between the alleged strategic importance of the three islands and geographical reality; the location of the three islands cannot in any way be compared with the locations of the Iranian port of Bander Abbas and the island of Qishm, both at the very entrance to the Straits of Hormuz. Furthermore, the island of Sirri is only a few miles away from the three islands, especially from Abu Musa, and could thus provide the same strategic protection which Iran holds as a pretext for maintaining its occupation of the three islands.[48]

The stated existence of Iranian strategic interests is a political rather than legal pretext. It reflects the hegemonic mentality that has been governing the Iranian political regime since the Shah's era and up to the present. Some observers go so far as to suggest that the strategic claims are simply a cover for the Iranian leadership's economic and ideological ambitions. They argue that Iran is seeking sovereignty over the three islands because its proven oil reserves are about to be exhausted; and that by exercising sovereignty over the three islands it can extend its territorial waters by an extra 12 miles. Such an act poses a threat to the Emirates' offshore oil wells.[49]

Irrespective of details of the Iranian strategy, it is important to stress that Gulf security is the responsibility of all Gulf states; it cannot and should not therefore be handled by a single state. Moreover, Gulf security can only be achieved through cooperation and neighbourliness, not by occupation of others' lands, nor by military hegemony.

UAE's Rightful Title to the Islands

The preceding analysis indicates that Iran cannot support its claim to the three islands by any of the conventional methods referred to in Public International Law. Let us now consider the ways and means whereby the UAE may establish title to the islands.

Initially it should be noted that rights of sovereignty and of negotiations related thereto were transferred from the emirates of Sharjah and Ra's al-Khaimah to the new federal state of the UAE, which was proclaimed on 2 December 1971. In accordance with the Constitution of the UAE, the Federation exercises sovereignty over all the lands and waters encompassed by the international borders of the member emirates.[50]

Scholars of international law assert that border treaties provide for succession, i.e. rights and obligations pass from the predecessor state to the successor state, in accordance with Article 4 of the 1969 Vienna Convention on the Law of Treaties.[51] Moreover, the Supreme Council of the United Arab Emirates, which is the highest federal authority in the state, comprising the rulers of the seven member emirates, itself declared that agreements concluded by individual emirates with neighbouring states shall be deemed as agreements between the UAE and the said states.[52]

The Emirates' ownership of the islands is based on legal documents, historical events and the actual exercise of territorial sovereignty. The legal documents include a collection of correspondence between the two branches of the Qawasim, correspondence between the British government (in its capacity as the protector of the emirates of Sharjah and Ra's al-Khaimah in accordance with a series of treaties between them) and the Iranian government, and a third collection of correspondence between rulers of the two emirates and British authorities in the Gulf. All such collections demonstrate:

- Clear-cut statements by the Qawasim rulers of Lingeh to the Qawasim of the UAE coast that the latter was the ruler of the three islands.
- A clear British recognition of the affiliation of the three islands to the emirates of Sharjah and Ra's al-Khaimah.
- Protestations by rulers of the two emirates to Britain against Iranian violations of their sovereignty over the three islands.[53]

Adequate reference has been made in the first part of this study to historical events confirming the Emirates' right to the three islands. It may be appropriate here to discuss some theories that support the Emirates' claim to sovereignty over the three islands.

Acquisitive prescription

In his book entitled *The Issue of Gulf Islands and International Law* Mohammed Aziz Shukri endorses the method of acquisitive prescription to support the Emirates' title to the islands.[54] However, I disagree with this point of view. While the majority of the conditions required for acquisitive prescription to hold exist, the last one raises doubts as to the very source and base of the UAE's title to the three islands. If applied in favour of the UAE, this condition may be seen as an implicit recognition of Iran's original claim to them. Emphatically, this is not so and, therefore, the Emirates should not make us of this argument.

Immemorial possession

However, the UAE may establish their title on the basis of immemorial possession of the islands. In such a case, the origin of the status quo remains unknown or doubtful. Since it is impossible to establish whether the process leading to the establishment of this status quo is legitimate or otherwise, it becomes legitimate.[55] The UAE has been holding the three islands for over two and half centuries. It is therefore impossible to prove whether or not this possession was legitimate at the time it occurred, namely the middle of the eighteenth century.

Historical consolidation of title

The UAE may also establish their title to the islands on the basis of the 'Historical Consolidation of Title', a recent concept developed by Charles de Visscher, a judge and former President of the International Court of Justice. The essence of this concept is that it attempts to combine all sovereignty-conferring elements in a single process. It also concentrates on lengthy utilization of a territory as a claim-proving factor. The concept thus reflects a blend of inseparable connections and interests and is normally employed to settle conflicting claims to territories where there is no clear former possessor state.

Some British legal experts (Bathurst, Ely & Chance) suggest that the basis of the UAE's sovereignty over the three islands stems from the above rule. They argue that the islands had not been regularly ruled by any particular state until they came under the control of the Qawasim who actually ruled them and in a peaceful manner. During their rule, the Qawasim exercised all aspects of sovereignty. Such an exercise was never accompanied by any change of intent on the part of the ruling authority; nor was it met by any significant opposition by neighbouring parties.[56]

Sharjah and Ra's al-Khaimah exercised all aspects of sovereignty over the three islands before the Iranian occupation. In addition to those aspects stated in the introduction to this study, the following may be listed:

- The governments of the two emirates exercised the right to levy and collect taxes and duties from pearl fishers and shepherds using the islands.
- Inhabitants of the islands carried the nationality of the two emirates respectively.
- Rulers of the two emirates were respectively represented on the three islands by governors.
- Public utilities on the islands, such as security, education, customs, health and mosques, were under the control of the two emirates.
- The governments of the two emirates hoisted their respective flags on the three islands, and applied their laws and regulations to their inhabitants.
- The governments of the two emirates maintained the right to grant concessions and licences to companies operating in the islands.[57]

The exercise of all such aspects of sovereignty is the 'root of title' supporting the UAE's title to the three islands. Iran, on the other hand, has never exercised any aspect of sovereignty over them. Professor Jamsheed Mumtaz, an Iranian academic, admitted in an article that Iran had at no time any tangible control over these islands; and was merely content to exercise remote and relaxed control over them, refraining from installing any official agency on any of the islands.[58]

Moreover, a memorandum prepared by the British legal expert Mr Lacelle stated that for 184 years at least, Iran had never exercised any real authority on the islands.[59] Significantly,

that memorandum is dated 4 September 1934. Given the period that then elapsed prior to the Iranian occupation of the three islands, we may correctly conclude that the total period of rule by the emirates amounts to more than 220 years.

Recognition and acquiescence[60]

Other significant evidence supporting the UAE's sovereignty over the islands relates to recognition and acquiescence. The UAE has been in possession of the islands for a long period and this has been recognized by a third state, Britain. In its correspondence with the rulers of Qawasim, Britain has repeatedly made a unilateral, express declaration recognizing the Qawasim's title to the islands. Moreover, Iran failed to protest over a long period at UAE possession of the islands.

Legal Characterization of the Status of the Three Islands, and the Memorandum of Understanding

What, then, is the legal status of the three islands at present? And what are the legal relationships resulting from the Iranian presence in them?

To begin with, it must be noted that the situation in the Greater and Lesser Tunbs is one of occupation by force as of 30 November 1971. The ruler of Ra's al-Khaimah had refused to sign a British-mediated Memorandum of Understanding with Iran. Consequently, the Shah ordered troops to land on the two islands and to occupy them by force. Thus, the current status of the two islands cannot be legally recognized, in accordance with the accepted legal principle which requires countries to refrain from the threat or use of force to gain acquisition of a territory or territories. Occupation dictates upon the occupier certain legal commitments which have to be observed while administering the occupied territory.

Moreover, Iran's occupation of the Tunbs constitutes the violation of another accepted principle in international law related to border issues, namely the principle of finality and stability of boundaries. It also violates the principle of inviolability of territorial integrity of states, a cornerstone in international relations.

The status of the island of Abu Musa is governed by a Memorandum of Understanding which does not, however, amount to a final agreement determining the status of the island. In spite of this bilateral agreement and understanding between the two parties, the Iranian government still views the Memorandum of Understanding as 'a temporary measure which would only postpone the eventual restoration of Iran's full sovereignty over the whole island.'[61] Following mediation by Sir William Luce, as special British Envoy, Iran and Sharjah agreed upon the six article Memorandum. It is evident from the text of the Memorandum that Sharjah did not cede its sovereignty over Abu Musa, and maintained its right to demand restoration of the island in full.

In the preamble of the Memorandum, it is stated that: 'neither Iran nor Sharjah shall give up their claims to the island, and neither shall heed the other's demands.'[62] Further scrutiny of the articles of the Memorandum would reveal a dual approach dealing with the presence of the two parties, i.e. Iran and Sharjah, on the island. The Memorandum refers to 'areas occupied by Iranian troops' and that Iran 'will occupy areas.' Meanwhile, it refers to the Emirate's peaceful presence saying, 'Sharjah will have full jurisdiction over the remainder of the island'.

It is thus clear that the island originally belongs to Sharjah, while the Iranian presence is but an occupation of the northern part of the island, a situation that came into being only recently.

It should be noted that Iran still recognizes the continuity and validity of the Memorandum of Understanding, as was stated by its Foreign Minister during a visit to Kuwait on 19 April 1992, and by the head of its negotiating team, Ambassador Mustafa Haeri, in September the same year. Meanwhile, Sharjah has continued to exercise all aspects of sovereignty over the island, including the hoisting of its own as well as the the UAE federal flags and the administering of health and education utilities for Emirates' citizens and Arab expatriates living on the island.

Quite apart from the political considerations that prevailed at the time of its signing, a purely legal examination of the Memorandum of Understanding shows it to be null and void. This nullification stems from a defect of substance relating to a signatory party (Sharjah), which signed the Memorandum under duress, as will be indicated later.

Duress and its invalidating consequences are considered differently by conventional and contemporary theories.[63] The conventional theory in international law distinguishes between two situations: duress exercised upon the representative of the state, and duress exercised on the state itself, upon signing an international treaty. Duress, material or moral, exercised on a state representative (head of state, foreign minister, ambassador or negotiator) annuls the treaty, and the state on whose representative duress was exercised is not bound by it. A very good example of this situation is the summoning by Nazi leader Adolf Hitler of the President of Czechoslovakia in 1939, whom he forced to sign a treaty under which the latter relinquished territories belonging to his country. Duress exercised upon the state itself, however, does not affect the validity of the treaty. Advocates of this theory argue that the threat to use force against a state is only a catalyst employed to urge it to sign a treaty. Legally speaking, the motive for contracting does not affect the validity of the contract. They also cite several examples of international treaties that have been concluded in the wake of wars, in which the victors imposed their will upon the defeated. They argue that any attempt to declare such treaties null and void would destabilize the world.

Under the new world order that emerged after the Second World War, and rejection of the principle of the use of force to settle disputes between states, a new theory was developed. This theory holds that duress, whether on the representative of the state or on the state itself, nullifies a treaty. Thus a treaty, concluded under duress or threat of force, shall not result in legal consequences to be complied with. An advocate of this theory, Hafez Ghanem, argues that the maintenance of unfair conditions resulting from treaties concluded under duress would not help stabilize international relations. On the contrary, such conditions would be a source of tension and instability, as the affected states would, sooner or later, seek to restore their rights through efforts to render such treaties null and void.[64] The stability cited by advocates of the conventional theory is based on unjust conditions, and as such cannot be regarded as real stability, this approach argues.

The late Sheikh Khaled bin Mohammed Al Qasimi, then ruler of Sharjah, explained the circumstances under which he found himself forced to sign the Memorandum of Understanding:

> *I had spent about two years collecting documents proving that the island is Arab territory, and that it belongs to Sharjah. I had asked a team of jurists to prepare legal documents and papers. These were presented to the Iranian Government. However, the logic of force and threat allowed no room for reason and legitimate proofs . . . Several factors contributed*

to the delicacy of the situation, combining to form significant pressure: Britain had threatened not to maintain the status quo on the island; Iran insisted that the island was Iranian, and that they would seize it by force; unfavourable economic conditions placed Sharjah in an awkward situation and weakened its position, severely affecting its manoeuvrability; other powers came to support Iran . . . Thus, after consultations with brothers, I deemed it appropriate to seek a formula that would freeze the problem politically, while dealing with it economically. Hence came the said agreement.[65]

From the above statement, it can be seen that the ruler was not acting of his own free will, and that he signed the Memorandum under an Iranian threat to use force, and due to a lack of support by Britain and neighbouring forces. Under such threats, the Memorandum of Understanding may be deemed abrogated as a contradiction of international law, on the basis of Article 52 of the Vienna Convention on the Law of Treaties (1969). As the Memorandum of Understanding is utterly null and void *ab initio*, military occupation can therefore be deemed the legal characterization of the status of the island of Abu Musa, the same status as prevails in the Greater and Lesser Tunbs.

Stances of the United Arab Emirates and Iran after 1971

Following Iran's occupation of the Tunbs, and the landing of its troops in Abu Musa in accordance with the Memorandum of Understanding, the newly emerging state, i.e. the United Arab Emirates, asked her sisterly Arab states to assist it in bringing the dispute before the United Nations. The Security Council convened on 9 December 1971. The Council President, citing Article 36 of the Charter of the United Nations, called for a resolution of the dispute by diplomatic means. It was thus decided to defer debate on the issue to give an opportunity to a third party to consider it and find an appropriate solution.

As of 30 November 1971, the UAE began its unceasing efforts to win support on two issues: its title to the three islands and its desire to resolve the dispute in accordance with international customs and laws.

Regarding the first question, the UAE, on 17 July 1972, sent a note to the President of the Security Council in which it affirmed that the three islands were Arab territories. On 5 October 1972, a statement was read out before the twenty-seventh session of the General Assembly, in which the UAE reaffirmed its sovereignty over them. A similar statement was read out before the Security Council on 20 February 1974. A third statement was read out before the UN Special Political Committee on 19 November 1974. Other notes were sent to the UN Secretary General on 6 August 1980 and 1 December 1980, in which the UAE reaffirmed its unchanging policy of affirming its sovereignty over the islands.

On the other side, Iran under the Shah, and later under the Islamic Republic, continued to ignore its international commitments with regard to the Tunbs, and continually violated the Memorandum of Understanding governing the situation in Abu Musa. It looked upon the dispute as a mere territorial misunderstanding between the two parties.

During the Shah's reign, Iran adopted an approach of imperial arrogance, paying no attention to appeals by the UAE. This attitude continued, and took an even more emphatic tone after

the Shah's downfall. Since the early 1980s, Iran has been acting in ways constituting flagrant violation of the Memorandum of Understanding and open intervention in the internal affairs of the UAE. Iranian actions have included the following:

- Encroachment upon territories belonging to the UAE, outside the assigned area for an Iranian presence in Abu Musa, by constructing roads and an airport as well as other civilian and military installations.[66]
- Moving troops in 1987 to the southern side of Abu Musa, and occupation thereof following an abortive coup in Sharjah.[67]
- The imposition, late in 1991, of restrictions on third party citizens wishing to enter the UAE zone of Abu Musa by requiring entry permits. As the UAE rejected this measure, Iran ordered all foreigners off the island in April 1992.[68]
- Preventing, late in August 1992, teachers working in Abu Musa, as well as some UAE nationals, from entering the island, and returning them to Sharjah harbours following three nights aboard ship.
- The launching, on 29 December 1994, of an air route linking Bandar Abbas and Abu Musa, an action that violates UAE sovereignty over the island.
- Conducting military manoeuvres in the UAE's territorial waters around Abu Musa island on 27 February 1999.[69]
- Construction of military and civilian establishments on Abu Musa island, and the deployment of medium-range missiles therein in February 1999.[70]
- Establishment of a municapility in Abu Musa affiliated to Bandar Abbas province and holding municipal elections therein.[71]

On 12 May 1993, Iran promulgated a law entitled 'Act on the Marine Areas of Iran in the Persian Gulf and Oman Sea'. Articles 1 and 2 of the said law define its scope. Article 1 states that 'sovereignty extends beyond its land territory, internal waters and its islands in the Persian Gulf'. Article 2 confirms that the islands belong to Iran. The two articles refer to the islands even more emphatically than Article 5 of a previous law promulgated in 1959, amending the law of 15 July 1934 on the territorial sea. These two articles together constitute a grave encroachment upon the sovereignty of the UAE over the three islands.[72]

Iran's current position may be briefly stated as follows: the Tunbs are part of Iran whose sovereignty over them is not debatable. However, negotiations over Abu Musa may be conducted on the basis of the Memorandum of Understanding in such as way as would ensure Iran's security, economic and strategic interests in the Gulf.

The second issue concerns the UAE desire to solve the dispute peacefully. In spite of being the party affected by occupation, the UAE strongly advocates a peaceful solution. In an interview, the President of the UAE, Sheikh Zayed bin Sultan Al Nahyan, stressed the need to refer the dispute to the International Court of Justice.[73] Likewise, in his address on the occasion of the twenty-third anniversary of the proclamation of the UAE, he urged Iran to enter into an objective and constructive dialogue, or otherwise to resort to international arbitration to resolve the dispute over the islands.[74] Along the same lines, the UAE Foreign Minister has, in speeches at successive sessions of the UN General Assembly, expressed the UAE readiness to start immediate, direct and unconditional negotiations with Iran to terminate the latter's military occupation of the three islands.[75] When Iran did not respond, he demanded that the dispute be referred to the International Court of Justice, this being the international agency entrusted with resolving border disputes.

In contrast to this moderate stance, the Iranian government continues to be vehemently opposed to the idea of referring the dispute to the International Court of Justice. It insists on bilateral negotiations. It should be noted that Iran had, in 1929, proposed that the dispute over the three islands be referred to international arbitration. This occurred during negotiations with Britain on the conclusion of an Anglo-Persian treaty.[76] It should also be recalled that Iran itself has resorted to the International Court of Justice with regard to several issues. However, since the Shah's era, Iran has been adamantly against referring the dispute either to international arbitration, or to the ICJ. Iranian President Hashimi Rafsanjani, for example, stated that 'referring the issue to an international court would not be viable'.[77]

Bilateral negotiations, however, have failed. They were started following the escalation of Iranian measures on the three islands in 1992. In the first round of negotiations, which was held in Abu Dhabi on 27–28 September 1992, the UAE delegation set forth several demands, the most important of which were: termination of the Iranian occupation of the Tunbs, reaffirmed commitment to the Memorandum of Understanding with regard to Abu Musa, non-intervention by Iran in any way in the UAE's exercise of its complete jurisdiction over the zone assigned to it in Abu Musa, and the finding of a decisive solution to the question of sovereignty over the island of Abu Musa. Iran, however, refused to debate the status of the Tunbs. Nor would it agree to refer the case to the International Court of Justice.

Following mediation by Qatar, a second round of talks was held in the period from 18 to 23 November 1995. The UAE delegation reiterated its previous demands. Unfortunately, however, no agreement was reached, even upon the agenda of the negotiations, due to Iran's refusal to debate the status of the Tunbs, and its rejection of a proposal to refer the issue to the International Court of Justice should negotiations fail to reach a solution within a specific period of time.

In a last-ditch bid to settle the dispute, the Foreign Ministers of the member states of the Gulf Cooperation Council announced on 3 July 1999 the formation of a tripartite committee that would set up a mechanism to start direct negotiation for settling the issue of Iran's occupation of the three island by peaceful means. The committee was made up of the foreign ministers of Saudi Arabia, Oman, Qatar and the Secretary General of the Gulf Cooperation Council. The Council's Ministerial Body had stated that the settlement of this dispute would certainly contribute to the betterment of relationships between GCC member states and the Islamic Republic of Iran. The United Arab Emirates welcomed the formation of the tripartitie committee. While voicing optimism, it emphasized that success of the committee would depend on how far Iran was prepared to respond to its good offices. Contacts between the committee and Iran have not produced any encouraging signs so far.

It is thus evident that the stance of the UAE regarding the dispute over the three islands is based on the fact that although the Iranian occupation is de facto, the UAE cannot and will not relinquish its sovereignty over the three islands. In this connection, Hassan Al Alkim says:[78]

> *The UAE sees the Iranians' occupation as de facto and cannot do anything about it; however, it has not ceded its sovereignty over them* (the islands). *The UAE, as a small state, aware of the imbalance of power with Iran, and the absence of a deterring force, whether regional or international, has preferred to keep a low profile on the issue. It has pursued a policy of peaceful co-existence with Iran, hoping that the development of good relations will inevitably lead to the settlement of the contentious problems.*

Ways and Means of Settling the Dispute

In the contemporary world, states are required to resolve their border disputes by peaceful means. It is no longer acceptable that such disputes be resolved by force. Refraining from the use of force has become a binding legal rule in international law. It is more effective than resorting to force, which only deepens differences and further kindles conflicts between neighbouring countries from generation to generation.[79]

International law provides several ways and means of settling disputes between states peacefully. These include diplomatic methods, such as negotiations, good offices, conciliation and mediation; political ways, such as resorting to regional and international organizations; and legal ways, such as referring the dispute to international arbitration or to the International Court of Justice.[80] Judicial settlement is normally effected through a neutral panel on the basis of the law, and the resulting verdict is thus legally binding.

In dealing with the dispute over the three islands, the UAE has adopted a peaceful approach compatible with its own capabilities, and with a respect for international law. Initially, it dispatched its Foreign Minister to Iran in April 1992 to discuss Iran's arbitrary measures. In September of the same year, it called for negotiations in Abu Dhabi to consider a diplomatic settlement. The attitude of the UAE delegation to these negotiations was prudent and balanced. It did not set forth prior conditions, such as the abrogation of the Memorandum of Understanding. On the contrary, it demanded full respect for it, while calling for a framework to settle the sovereignty issue within a specific time limit.

As diplomatic channels failed to produce a result, the UAE resorted to political means by referring the issue to the General Assembly of the United Nations. The UAE has indicated that it adheres to its right to exercise sovereignty over the three islands, stressing its title to them. Meanwhile, the UAE has offered to resolve the issue legally through the International Court of Justice in the Hague, in accordance with Article 33 of the Charter of the United Nations and Article 36 of the Statute of the International Court of Justice. However Iran, because of the weakness of its legal position and the difficulty of supporting its claim to the three islands, has rejected such an approach. Thus, the only remaining way is to submit the issue to the UN Security Council, which could pass a recommendation referring the dispute to the International Court of Justice, this being the appropriate channel for resolving it peacefully.

On 2 January 1994, the United Nations Secretary General stated that the world organization was ready to play any role in resolving the dispute over the three islands within the context of diplomacy, mediation and arbitration, should the two parties seek its mediation.[81]

1 *Arabian Gulf Intelligence*, Selections from the Records of the Bombay Government, Oleander Press, p 300. Also see for the early history of the Arab people of this region, based on sources of the Dutch East India Company, B.J. Slot, *The Arabs of the Gulf 1602–1784*, (Arabic Translation) Abu Dhabi, The Cultural Foundation (1993) Especially chapters seven and nine.

2 M.E. Bathurst, E. Northcutt, and C. Chance, *Sharjah's Title to the Island of Abu Musa*, unpublished report (September 1971) pp 2–4.

3 *Ibid.*, pp 4–5.

4 Mohammed Mursi Abdullah, *The United Arab Emirates and Its Neighbours*, (Arabic) Kuwait, Darul Qalam (1981) pp 323–4.

[5] The Qawasim of Ra's al-Khaimah had separated themselves from Sharjah's Qawasim and established an independent emirate in the period from 1869 to 1900. They re-united in 1900 only to separate again in 1920 and remain so until today.
[6] *Ibid.*, pp 324–5.
[7] *Ibid.*, p 132.
[8] Mohammed Hassan Al Aydaroos, *Arab–Iranian Relations (1921–1971)* (Arabic) Kuwait, Zatul Salasel (1985) pp 254–6. Also see Ibrahim, Abdulaziz Abdulghani, *Pax Britanica in the Arabian Gulf: 1899–1974* (Arabic) Riyadh, Darul Marrikh (1981) pp 305–7.
[9] See R. S. Zahlan, *The Origins of the United Arab Emirates*, The Macmillan Press Ltd, London (1978) p 80.
[10] Pirouz Mojtahed-Zadeh, *The Islands of Tunb and Abu Musa: An Iranian Argument in Search of Peace and Co-operation in the Persian Gulf*, University of London, SOAS, July 1995, p 36.
[11] Zahlan, *op.cit.* p 129. This contradicts a claim by Pirouz Mojtahed-Zadeh, Secretary of the London-based Society for Contemporary Iranian Studies, that Lingeh rulers were the first to grant exploration concessions. This was stated in his article entitled 'The Issue of Abu Musa Island From An Iranian Point of View' in *The Dispute Over the Gulf Islands*, London, Arab Research Centre (1993) p 22.
[12] See Waleed Hamdi Al Adhami, *The Dispute Between the United Arab Emirates and Iran over the Islands of Abu Musa, Greater and Lesser Tunbs in British Documents 1764–1971*, (Arabic) London, Darul Hekma (1993) p 31. In their correspondences, British circles stress that the main reason behind this move by the Persian Customs Director, Mr Dambrain, was Russian instigation for Iran to rival British presence in the Gulf. See D. Hawley, *The Trucial States*, London, George Allen & Unwin Ltd (1970) p 162.
[13] *Ibid.*, p 162.
[14] Telegrams from The Political Resident to Sheikh of Sharjah, 28 September 1912, and 22 October 1912. See Al Adhami, *op. cit.*, p 32.
[15] FO 371/13010, India Office, Status of Islands of Tunb, Little Tunb, Abu Musa and Sirri, 24 August, 1928. See Al Adhami, *op. cit.*, pp 22–4
[16] See Zahlan, *op. cit.*, p 90.
[17] See Al Adhami, *op. cit.*, pp 61–5. See also Mojtahed-Zadeh (1995) *op.cit.*, p 49 and R.S. Zahlan, 'The Dispute over Arabic Islands in the Gulf 1928–1971' (Arabic) in *Journal of Gulf and Arabian Peninsula Studies*, Kuwait University, vol. 6, April 1976, p 21.
[18] Zahlan, *op. cit.*, pp 126–7. Also see Ahmed Jalal Al Tadmori, *The Three Arab Islands, A Documentary Study*, (Arabic) Ra's al-Khaimah National Printing Press (1994) pp 79–80.
[19] Abdulwahhab Abdoul, *The Three Arab Islands in the Gulf: Extent of the Validity of Regional Changes Resulting from the Use of Force*, (Arabic) Ra's al-Khaimah, Centre for Studies and Documents (1993) p 170.
[20] *Ibid.*, pp 279–80
[21] Zahlan, *op. cit.*, p 24. Also see F. Heard-Bey, *From Trucial States to United Arab Emirates*, (2nd ed) Longman (1984) p 364.
[22] Mojtahed-Zadeh (1995), *op.cit.*, p 55.
[23] *Ibid.*, p 365. For minutes of the meetings between the British Envoy and the Ruler of Ra's al-Khaimah , see Al Tadmori, *op. cit.*, pp 127–55.
[24] Heard-Bey, *op. cit.*, note 105, p 479
[25] Mojtahed-Zadeh (1995), *op. cit.*, p 56.
[26] These documents were translated into Arabic and published in *Al Khaleej* newspaper during the period of 1–1 to 4–2–2000. See especially issues no. 7545, 7550 and 7565.
[27] Mojtahed-Zadeh (1993), *op. cit.*, p 56
[28] Abdulwahhab Abdoul, 'Crisis of the Three Arab Islands Between a Clear UAE Attitude and a Contradicting Iranian Stance' (Arabic), a paper submitted to *Islands of Peace Seminar*, Ra's al-Khaimah, November 30 to December 1, 1994, pp. 9–11.
[29] Abdoul, (1993), *op. cit.*, pp 118–9
[30] *Ibid.*, p 175.
[31] Zahlan, *op. cit.*, p 80.
[32] Davoud H. Bavand, 'The Legal Basis of Iran's Sovereignty over Abu Musa Island' in Hooshang Amirahmadi (ed.) *Small Islands, Big Politics*, Macmillan Press Ltd (1996) p 78.
[33] *Ibid.* p 89, Mojtahed-Zadeh (1995) *op. cit.*, p 39. Hooshang Amirahmadi, 'Iran-Emirates Dispute: Political and Colonial Aspects' (Arabic) in *Shoun Al Awsat*, Beirut, vol. 44, Sept. 1995, p 32.
[34] Mojtahed-Zadeh (1995) *op. cit.*, p 40.
[35] Bavand, *op. cit.*, pp 89–93.
[36] Such weakness in proving Iranian sovereignty and political disorder is not confined to the twentieth century. In fact it goes back to the era of Safavids, then Nader Shah and on to Qajars. See Mojtahed-Zadeh (1995), *op. cit.*, pp 10–12.
[37] For further details on these conventional methods see C. Rousseau, *Public International Law* (translated into Arabic) Beirut, Al Ahliyah for Publishing and Distributing (1987) pp 147–51; et al.; Hamed Sultan *Public International Law*, (4th ed) (Arabic) Cairo, Darul Nahda Al Arabia (1987) pp 380–93; and Ahmed Sarhal, *Law of International Relations* (Arabic), Beirut, Al Jamiyah for Studies, Publishing and Distributing (1990) pp 147–60.

[38] Faisal Abdulrahman Taha, *International Law and Border Disputes*, (Arabic) Abu Dhabi Printing and Publishing Company (1982) pp 21–2.
[39] Sarhal, *op. cit.*, p 148.
[40] For forms and conditions of acquisitive prescription see I. Brownlie, *Principles of Public Law*, (4th ed) Oxford, Clarendon Press (1990) pp 153–9.
[41] Taha, *op. cit.*, p 26
[42] This conduct was explained by Ali Humaidan, the first UAE envoy to the UN, in a lecture entitled, 'Emirates' Islands: Legal and Security Rights', given at the UAE University in Al Ain, 26 October 1992.
[43] Taha, *op. cit.*, pp 135–42.
[44] Mumtaz, *op. cit.*, p 59.
[45] Bathurst, Northcutt & Chance, *op. cit.*, p 13. See also Abdoul (1993) *op. cit.*, pp 131–2 and Mustafa A. Al Najjar, 'Britain and Sovereignty over Arabian Gulf Islands' in *Journal of Arabian Gulf*, University of Basra, vol. 8, 1977, p 31.
[46] Bathurst, Northcutt & Chance, *op. cit.*, p 13.
[47] *Ibid.*, pp 11–4.
[48] Abdoul (1993) *op. cit.*, pp 144–75.
[49] Hassan Al Alkim, 'The United Arab Emirates Perspective On the Islands' Question,' in *The Dispute Over the Gulf Islands*, London, Arab Research Centre (1993) p 31. He has noted that the Iranian oil reserve will not last more than three decades.
[50] Article 20 of the *Constitution of the United Arab Emirates*.
[51] Ahmed Mohammed Rifaat, 'Dispute over the Arabian Gulf Islands and the prerequisites for a settlement in accordance to the rules of International Law', (Arabic), a paper submitted to Ra's al-Khaimah, *Islands of Peace Seminar*, 30 November–1 December 1994, p 22.
[52] The declaration was published in the *Official Gazette*, Issue no. 240, Year 22, July 1992
[53] Abdulwahhab Abdoul, 'Legal Bases Supporting UAE's Sovereignty over the Three Islands', (Arabic) in *Arabic History*, Morocco, vol. 1, Nov.1996, pp 47–49.
[54] This was quoted by Al Aydaroos, *op. cit.*, pp 437–8.
[55] Taha, *op. cit.*, p 26.
[56] Bathurst, Northcutt & Chance, *op. cit.*, pp 15–18.
[57] For further details, see Abdoul (1993), *op. cit.*, pp 263–80.
[58] Mumtaz, Jamsheed 'Legal Status of Some Gulf Islands: Abu Musa, and Greater and Lesser Tunbs' in *Shu'un al-Awsat Journal* (Arabic), Issue no. 47, December 1995 p 59.
[59] Abdullah, *op. cit.*, p 366.
[60] See Brownlie, *op.cit.*, pp 159–62.
[61] Mojtahed-Zadeh (1995), *op. cit.*, p 56.
[62] *Al Khaleej* newspaper, Sharjah, published text of the Memorandum of Understanding in its issue no. 4865, 4 September 1992.
[63] For further details, see Esam Sadeq Ramadan, *Unequal Treaties in the International Law*, (Arabic) Cairo, Darul Nahda Al Arabia (1978).
[64] This was quoted in *ibid.*, p 350.
[65] Al Aydaroos, *op. cit.*, pp 427–428. Also see Jamal Zakaria Qasem, 'Old Emirates and a New State' in *United Arab Emirates: A Comprehensive Survey*, (Arabic) The Arab League Educational, Cultural and Scientific Organization (1978) pp 68–71.
[66] Al Tadmori, *op. cit.*, p 290.
[67] R. Schofield, 'Abu Musa and the Tunbs: the historical background' in *The Dispute Over the Gulf Islands*, London, Arab Research Centre (1993) p 15.
[68] J. Moberly, 'Renewed Tension in the Gulf over Abu Musa and the Tunbs' in *The Dispute Over the Gulf Islands* , London, Arab Research Centre (1993) p 16.
[69] An address by the United Arab Emirates foreign Minister before the seventieth session of the GCC foreign ministers, *Al-Khaleej* newspaper, 15 March 1999.
[70] Interview with Sheikh Hamdan bin Zayed Al Nahyan, Minister of State for Foreign Affairs, Al-Khaleej newspaper, 18 July 1999.
[71] *Al-Khaleej* newspaper 15 March 1999.
[72] For full text of the law, see: United States Department of State, Bureau of Oceans and International Environmental and Scientific Affairs; *Limits in the seas: Iran's Maritime Claims*, No. 114, 16 March 1994.
[73] An interview with the London-based *Al Hayat* newspaper, 20 March 1994.
[74] Address by the President of the UAE, 2 December 1994.
[75] See for example, address by the UAE Foreign Minister before the 49th session, 5 October 1994 and his address before the 50th session, 4 October 1995. Also see an interview with Sheikh Hamdan bin Zayed, Minister of State for Foreign Affairs, in *Al Ahram* newspaper, Cairo, 3 June 1996.
[76] Mojtahed-Zadeh (1993), *op. cit.*, p 24.
[77] Abdoul (1994) *op. cit.*, p 47, quoting the London-based *Al Sharq Al Awsat* newspaper, Issue no. 5671, 8 June 1994.
[78] Al Alkim, *op. cit.*, pp 30–1.

[79] Rifaat, *op. cit.*, p 17.

[80] On ways and means of resolving international disputes, see J.G. Merrills, *International Dispute Settlement*, London, Sweet & Maxwell (1984); Mohammed Basheer Al Shafei, *Public International Law in War and Peace*, (Arabic) (4th ed) Cairo, Darul Fikr Al Arabi (1979) pp 603–40; Ahmed Abdulhamid Ashoushi & Omar Abubakr Bakhashab, *Concise in Public International Law* (Arabic) Alexandria, Shabab Al Jamiaa Establishment, (1990) pp 557–99; Mohammed Aziz Shukri, *An Introduction to Public International Law in Peace Time*, (Arabic) (4th ed) Damascus, Darul Fikr (1983) pp 423–38.

[81] *Al Khaleej* newspaper, Sharjah, Issue no. 5349, 3 January 1994.

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Evolution and Performance of the UAE Economy 1972–1998

Ali Tawfik Al Sadik

Introduction

The United Arab Emirates' (UAE) economy has been transformed from a precarious base of fishing and pearling, together with some local agriculture, to an oil-based, high-income economy with a high concentration of expatriate labour driving the engines and wheels of the different sectors. The transformation of the economy brought with it challenges and opportunities that induced discussions on how best to confront the challenges and utilize the opportunities in an optimal manner. The analysis of the evolution of the economy that will be presented indicates that the UAE Government has succeeded, to a great extent, on both counts. In section two an overview of the economy in 1998 is presented, utilizing a production and demand structure. Section three traces, discusses and analyses the evolution of the economy over the period 1972–1998, highlighting the oil boom challenges and opportunities, the sources of growth and instability in incomes and prices. In section four the evolution of the consolidated budget, an effective policy tool for economic and social development, is outlined and the achievements in the social sphere are highlighted. Section five presents a brief discussion of the evolution of the trade and current account balances in the balance of payments. Section six indicates briefly the monetary and credit policy in the UAE and this is followed by a short concluding section.

Overview of the Economy

The UAE, which was established on 2 December 1971, is a federation of the seven emirates: Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Qaiwain, Ra's al-Khaimah and Fujairah. It has a total area of approximately 84,000 sq. km with an estimated population of three million inhabitants in 2000, of which non-nationals make up over three-quarters.[1] The labour market is dominated by expatriates who accounted for more than 91 per cent of total employment in 1998.[2] The UAE per capita income on the basis of the gross domestic product (GDP) amounted to US $16,700 in 1998 and is considered relatively high compared to the average per capita income of developing countries.[3] Three emirates, Abu Dhabi, Dubai and Sharjah, account for more than 93 per cent and 84 per cent of the UAE GDP and population respectively. The distribution of GDP and population between the emirates in 1998 was as in Table 1 below.

Table 1. Distribution of GDP and population between the emirates in 1998

	GDP	Population	GDP per capita	
	%	%	dh	US $
Abu Dhabi	55.32	38.59	87,820	23,929
Dubai	27.88	28.92	59,066	16,094
Sharjah	9.88	16.77	36,105	9,838
Ra's al-Khaimah	2.81	5.80	29,638	8,076
Ajman	1.28	5.23	22,964	6,047
Fujairah	1.51	3.17	29,194	7,955
Umm al-Qaiwain	0.64	1.49	26,256	7,154

Memorandum: 1998 UAE GDP = 170,066 mn dirhams; 46,340 mn US $; population = 2, 776,000
Source: On the basis of Ministry of Planning, *Annual Economic Report 1999*, Tables 1 and 6.

The income distribution between the emirates is skewed in favour of Abu Dhabi, as its income share of 55.32 per cent is 143.35 per cent of its population share. This is reflected in the differences between the per capita incomes of the emirates presented in Table 1. Abu Dhabi's 1998 per capita income at US $23,929 is the highest for the emirates and is about four times the lowest per capita income, that of Ajman, which did not exceed US $6050. In fact, the per capita incomes of all the emirates, except Abu Dhabi, are lower than the UAE average per capita income of US $16,700

The cited income differences between the emirates are generated mainly by the variations in their natural resource endowments. The most important resource the UAE possesses is hydrocarbons (oil and gas). UAE proven oil reserves are estimated at 98.10 billion barrels (bbl) and gas reserves were 6003 billion cubic metres (bcm) at the end of 1998. UAE crude oil production was 2.278 million barrels per day (mb/d) in 1998 and gas production was 48,860 million cubic metres (mcm) per year in 1997. These UAE petroleum related amounts are split between the emirates as shown in Table 2 below.

Table 2. Production and reserves of oil and gas

(Oil: production in mb/d & reserves in bbl)
(Gas: production in mcm per year & reserves in bcm)

	Production	Reserves	Production*	Reserves
	Oil		Gas	
Abu Dhabi	1.990	92.2	14.30	6,003
Dubai	0.230	5.9	1.7	121
Sharjah.	.058	–	0. 20	303
Ra's al-Khaimah.	–	–	0. 04	31
Total	2.278	98.10	48,860	5779
World	72.760	10,517.73	2,898,180	152,504

*1997
Sources: 1. *Petroleum Economist*, September.
2. OAPEC, *Secretary General Annual Report 1998*, Tables 2-6 to 2-9, pp 95–101.
3. EIU, *Country Profile United Arab Emirates 1998–1999*.

The impact on their income shares of the distribution of the petroleum resource between the emirates is reflected in its contribution to their GDPs. The shares of value added of the oil sector in the emirates' GDPs in 1997 are shown in Table 3 below.

Table 3. Contributions of the oil sector to emirates' GDPs in 1997

(per cent of the emirate's GDP)

Abu Dhabi	Dubai	Sharjah	Ra's al-Khaimah	UAE
43.72	12.15	7.48	1.3	29.63

Source: calculated based on Ministry of Planning, *Annual Economic Report 1999*, Table 7

Structure of GDP: the demand side

Crude oil production contributed about 22 per cent to UAE GDP in 1998. However, the oil sector's impact on UAE economic activities and evolution is more extensive. Oil exports are the main source for foreign exchange earnings and government revenues, accounting for more than 37 per cent and 60 per cent of their totals respectively in 1998 (total exports and re-exports = Dh 111.45 billion, of which Dh 42.2 billion from oil and gas, total public revenue Dh 42.69 billion, of which Dh 25.50 billion from oil and gas).[4]

The impact and importance of such shares on the overall economic activity may be analysed and gauged through the structure of expenditure on GDP utilizing the income determination equality, namely:

GDP = Cp + Ip + G + X – Z (1)

where: Cp = private consumption expenditure
Ip = private investment expenditure
G = government consumption and investment expenditure
X = exports of goods and non-factor services
Z = imports of goods and non-factor services

It is appropriate to mention that available national accounts data do not split investment expenditures between the private sector and the Government. However, government financial statistics contain data on government investment expenditures (Ig) which may be used to obtain private investment expenditure (Ip) from the relation:

Ip = I – Ig

where I= total gross investment and Ig = government investment expenditure.

In fact, total investment in the UAE is split three ways: government gross fixed capital formation, public sector gross fixed capital formation, and private sector gross fixed capital formation. Total gross investment includes change in stocks.

The shares of the variables on the right-hand side of the income determination equality have changed significantly between 1995 and 1998 as reflected in the following data:

Table 4. Structure of aggregate demand (components of aggregate demand as per cent of GDP) in 1995 and 1998

Variable	1995	1998
Cp/GDP	47.92	53.12
Ip/GDP	20.76	22.14
G/GDP((Cg+Ig)/GDP)	25.38(16.45+8.93)	24.72(16.78+7.94)
X/GDP	68.96	67.4
Z/GDP(–)	63.02	67.38
Total	100.00	100.00

Source: UAE, Ministry of Planning, *Annual Economic Report, 1999*, Tables 1 and 5

These shares reveal that the UAE economy is highly dependent on the external sector as reflected by the trade ratio (export plus import shares) which exceeded 131 per cent and 134 per cent in 1995 and 1998 respectively. Both export and import shares are relatively high and consequently the external sector plays a major role in the performance and evolution of the UAE economy. In addition, the government sector, as reflected by its expenditure share (G/GDP), plays an important role in the economy. Private sector expenditures accounted for more than 68 per cent of GDP in 1995 and exceeded 75 per cent in 1998. Thus, domestic absorption (A) (equal to the sum of private and government expenditures on consumption and investment) accounted in 1995 for a little bit more than 94 per cent of GDP, indicating a positive net export of goods and non-factor services (X–Z). In contrast, domestic absorption in 1998 accounted for approximately 100 per cent of GDP, which is reflected by approximate equality between exports and imports of goods and non-factor services. However, imports of goods and non-factor services (Z) accounted for approximately 67 per cent of A in both 1995 and 1998. This is another measure of the dependence of the economy on the policies of and developments in economies of its international trade partners.

Structure of GDP: the production side

The production side of the UAE economy is heavily dependent on expatriate labour. A production theory framework may be utilized to understand the economic impact of expatriate labour on the economy. At the aggregate level labour and capital, the traditional factors of production, technology and organization (management) are combined to produce aggregate output Q. In mathematical terms, this relation takes the form:

Q = F (K, L, O) (2)

where: Q = Output
K = Capital input
L = Labour input
O = Organization, Management
F = Technology

The UAE has had no capital constraint since, thanks to the foreign exchange earnings from oil and gas exports, it has been able to purchase from international markets the capital goods and services needed for its production processes. But the size of indigenous population (nationals) and consequently the indigenous labour force was and still is a constraint, from quantitative and qualitative aspects. For example, the labour force in the UAE numbered 1,378,000 workers in 1998 (about 49.64 per cent of the population) of which more than 91 per cent were expatriates. This labour force, together with the capital services, management and available technologies in the different sectors of the economy, produced the equivalent of Dh 170,066 million (US $46,340 million) of final goods and services (GDP at factor cost) in 1998. Compensation of employees (wages and salaries) accounted for only 30.46 per cent of the GDP, a share less than half of the two thirds' share estimated from Cobb-Douglas production functions for other economies (Table 4 in the annex). The balance in the 1998 GDP is allocated to depreciation of fixed capital stock and operating surplus (owners of capital). This large divergence between labour share in the UAE GDP and in other economies can be comprehended by analysing the distribution of the labour force between the economic sectors and their contribution to GDP. Table 5 in the annex presents the said labour force distribution and the structure of GDP by origin.

The information content in Table 5 is important for understanding the low share of wages in GDP and for labour policy discussions on the issue of national versus foreign labour involvement in the economy. It is clear that there are large differences between the productivity of labour employed in the different sectors. The average labour productivity (GDP divided by number of workers) is about Dh 123,000 in 1998. The maximum labour productivity is in crude oil (Dh 1,687,260) and the minimum is in domestic services of households (Dh 10,785) with a standard deviation of Dh 451,371.

Table 5. Some statistics on labour productivity in the UAE economy in 1998 (dirhams)

Average	123,371
Maximum	1,687,260
Minimum	10,785
Standard Deviation (St. d.)	451,371

Source: based on Table 5 in the annex.

The crude oil subsector employed roughly 1.6 per cent of the labour force, but contributed about 22 per cent of GDP in 1998. The next best labour productivities are in finance and insurance (Dh 528,611) and real estate and business (Dh 513,826). These sectors (crude oil, finance and insurance, and real estate) employed less than 6 per cent of the labour force yet they contributed about 39 per cent of GDP. In contrast, the three sectors, wholesale, government and domestic services of households, employed about 38 per cent of the labour force, but contributed 24.5 per cent of GDP. Further, if the construction and agriculture sectors are added then the employment percentage increases to about 64 per cent, but their contribution to GDP increases only to about 37 per cent.

The analysis of the employment shares and sectoral shares in the UAE GDP leads to the issue of optimal allocation of the labour resource. In theory, the allocation of a resource between different uses should be in accordance with the principle of equality of the marginal productivities of the resource in the different uses, if one is to achieve optimal results. In the case under analysis, marginal productivities of labour in the different sectors are not available. However, as a proxy, the average labour productivities are presented in Table 5 in the annex.

These average productivities show wide variations and the oil sector is ahead of all sectors by a very large margin. The wide and extensive variation between the labour productivities in the different sectors is to be expected on the basis of differences in the quality of labour and the nature of the sector.

The special nature of the oil sector

The oil sector is not like any other sector because oil reserves are non-financial assets and these are part and parcel of national wealth (Kendrick 1972; Fisher 1965; Hicks 1978). Given this concept, then the contribution of the crude oil subsector of Dh 36,951 million in 1998 is not value added. That is, it is not income generated from an asset. It is rather transforming an asset from one form (oil) to another (foreign exchange or financial asset). This way of looking at the oil sector shows that the confusion between the concepts of wealth and income leads to income illusion about the proceeds of petroleum exports. The income illusion manifests itself in several economic variables, namely:[5]

- Overestimation of national income level.
- Overestimation of national saving.
- Distortion of the current account position.
- Underestimation of domestic absorption.
- Overestimation of the accumulation of national wealth.
- Distortions of the contributions of the different sectors to the national income.
- Underestimation of foreign aid.

These are important issues that have been raised in the literature and have been addressed in the framework of the 1993 United Nations System of National Accounts.

The adjusted GDP (AGDP) and labour productivity

To remove some of the distortions of the contributions of the different sectors to GDP, the contribution of crude oil is removed and an adjusted GDP is considered for 1998:

AGDP = GDP – crude oil = 170,066 – 36,951 = 133,115

Table 6 in the annex presents sectoral employment and contributions to adjusted GDP (AGDP) in 1998.

Average labour productivity relative to AGDP is about Dh 98,000, with a maximum of Dh 529,000 in the finance and insurance subsector and a minimum of about Dh 11,000 in the domestic services of households and a standard deviation of Dh 171,200.

It is important to note that the domestic services sector employs more than 11 per cent of the labour force (excluding employment in the crude oil subsector) but contributes less than 1.5 per cent of AGDP. Low contribution to value added, an outcome of low productivity, is a good and practical starting point for discussion on labour policy in the UAE. If this is granted, then a criterion to identify low labour productivity would be to compare the variable indicator prod with one, prod being defined as:

$$\textbf{prod} = \frac{\text{Sector's share in GDP}}{\text{Sector's employment share}}$$

If prod for a sector is less than one, the sector should be a target for study, analysis and reform aiming to raise its labour productivity.

According to this indicator the five sectors, agriculture, construction, wholesale, other services and domestic services of households, are low productivity sectors. These sectors employed about 62 per cent of the labour force, excluding the oil sector, yet their contribution was less than 39 per cent of AGDP in 1998. Agriculture, other services and domestic services are especially low productivity sectors and should be targeted for study and reform (Table 6 in the annex).

To conclude this section, it is appropriate to mention that the UAE economy is market based, open with a relatively high trade ratio, and has liberal trade policy and exchange rate convertibility for current and capital transactions. The lifeline of the economy is petroleum and it is heavily dependent on expatriate labour. The UAE economy has made important strides in its development despite the violent fluctuations of its income during the last three decades, thanks to the persistent efforts of the UAE President, HH Sheikh Zayed bin Sultan Al Nahyan, and the rulers of the emirates.

In the following sections, the evolution of the economy during the period 1972–1998 is presented, analysed and evaluated.

Evolution of the Economy

The UAE economy has witnessed several phases of growth and development. Up to the end of the 1950s, the economy was characterized by limited natural and human resources. Economic activities were centred mainly on agriculture (date cultivation, locally consumed vegetables and fruits), fishing, the raising of livestock, mostly camels, traditional manufacturing (tents, rugs and carpets, gowns, daggers and swords and some dried foods) and pearling.[6] The UAE population is estimated to have been 72,000 and 86,000 inhabitants in 1950 and 1958 respectively.[7]

Oil boom challenges and opportunities

Foreign trade activity entered a new phase with the production and export of oil in the emirates: Abu Dhabi in 1962, Dubai in 1969 and Sharjah in 1970.[8] The oil activity started to shape the evolution and development of the UAE economy in the 1970s as a result of the huge increase in oil production and exports and government revenues. Oil production increased from 253 mn b in 1970 to about 619 mn b in 1975; exports increased from 253 mn b to about 606mn b and oil revenues jumped from US $233 million to US $6000 million. The huge growth in oil revenues during the period 1970–1975 (about 2475 per cent) is an outcome of the increase in production and the adjustment in government take.[9]

The unprecedented affluence the UAE started experiencing from the early 1970s, thanks to the structural changes in the international oil industry, brought challenges and opportunities to its leadership. The challenges were tri-dimensional: political, social and economic. As mentioned earlier, the UAE was established in December 1971 as a federation of seven emirates with limited natural resources in addition to petroleum, which was mainly concentrated in Abu Dhabi. Thus, Abu Dhabi and, to a lesser degree, Dubai received the oil revenues. Given this situation, the first challenge facing the Government was how to utilize the revenues for strengthening and cementing the federation, improving and expanding the social services to raise the standard of living and develop the non-oil productive base of the economy. In the event, the UAE President, HH Sheikh Zayed bin Sultan Al Nahyan, supported and promoted development through planning and action as a single unified country. His paradigm was a trade off between Abu Dhabi's oil wealth and the rulers' release of personal authority to the Federal Government. This paradigm helped to cement and strengthen the federation politically, socially and economically. One of the early achievements of the UAE Government was the monetary integration of the emirates which culminated in May 1973 with the establishment of the UAE Monetary Agency and the issue of the UAE national currency, the dirham, which replaced both the Qatari/Dubai riyal circulating in the northern emirates and the Bahraini dinar circulating in Abu Dhabi.[10] In 1980 the Monetary Agency was replaced by the UAE Central Bank, which was charged with the responsibilities usually assigned to a central bank.

In June 1974 the UAE Council of Ministers defined and outlined the main themes and directions for development.[11] Thus, in the economic sphere, development should aim to:

- Change the productive structure of the economy, optimize its capacity, diversify its activities and maximize export revenues.

- Concentrate on the expansion and exploitation of natural resources, promote and support manufacturing and lower the pressure on the growth of imports.
- Adopt capital-intensive projects so as to lower the demand for labour.
- Develop the infrastructure in a compatible way with the requirements of production of goods and services without barriers or bottlenecks.

Development in the social sphere should proceed on the basis that:

- The ultimate objective of any development plan is the human being.The different social services are therefore a basic right for him/her. These services include health care, education (with a view to supplying the country's labour demand for the different skills and specializations, along with its cultural and information aspects), the care of the environment, achieving the country's security and safeguarding the foundations of society, its morale, holy beliefs and shrines.
- With this foundation, the aim should be to supply the country with a trained and skilled national labour force to manage the economy and prepare and implement development plans.

Given these economic and social development objectives, it is appropriate to mention that the UAE Government in general, and the UAE President in particular, has always stressed that the fundamental objective of development is the welfare of society and ensuring its continuity for the present and future generations. The human being has always been at the centre of development in the UAE, which indicates the importance the Government placed on human development long before the publication of the first report, Human Development Report 1990, by the United Nations Development Programme (UNDP).[12]

The opportunities and challenges brought with affluence could be outlined as follows:

- No budget constraint as a result of a large increase in oil revenues and high saving rate.[13]
- A need for regulations and institutions in the public and private sectors.
- Shortage of data banks and research centres to support decision-making.
- Need to rationalize the answers to the basic economic questions of what, how and for whom to produce.

In light of the above, it is appropriate to study and evaluate the evolution of the main economic indicators.

Evolution of income and prices

The size of the UAE economy, measured by the nominal GDP, has grown by more than 26 fold during the period 1972–1998: nominal GDP increased from Dh 6450 million in 1972 (US $1471 million) to Dh 170,066 million (US $46,340 million). However, the UAE real GDP in 1998 was only about 4.161 times its level in 1972 due to the erosion of purchasing power as a result of the increase in inflation index by about 6.34 times (Table 1 in the annex).

The expansion of the economy has not been smooth. In fact, it suffered violent instabilities as reflected in the large expansions and contractions during the period 1972–1998 (Figs. 1 and 2). Using the sign of GDP growth rate as a criterion, the UAE economy witnessed 15 positive and 11 negative growth rates during the period: the maximum growth rate was 56.03 per cent in 1973 and the minimum was negative 18.8 per cent in 1986 with an average growth rate of 6.5 per cent and 14.85 per cent standard deviation.

Fig. 1. UAE real GDP in mn dirhams

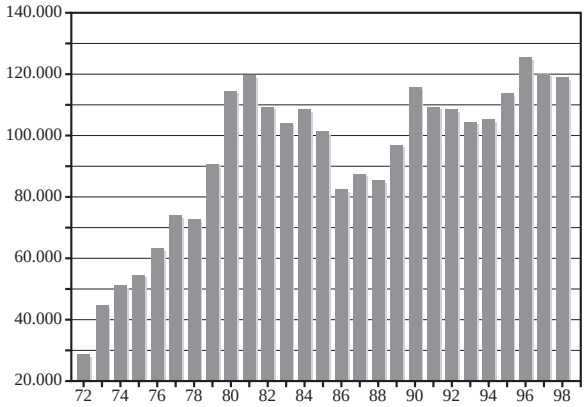


Fig. 2. UAE real GDP growth rates (per cent per annum)

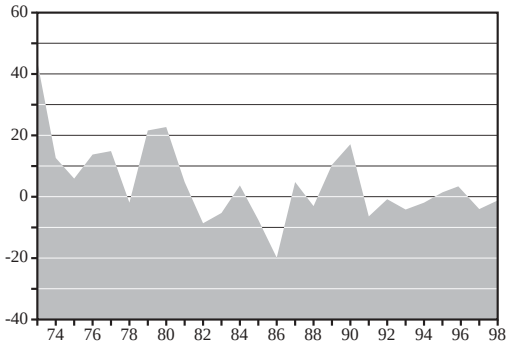


Fig. 3. UAE per capita real GDP (dirhams)

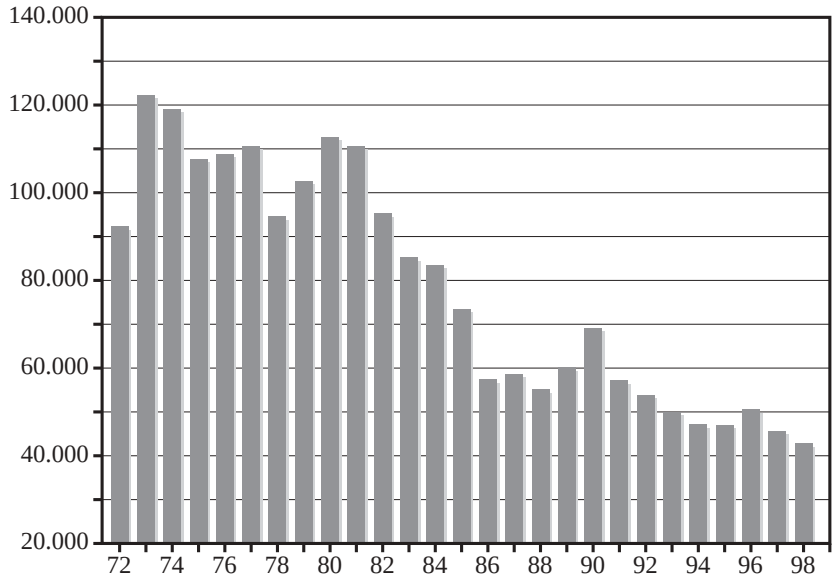
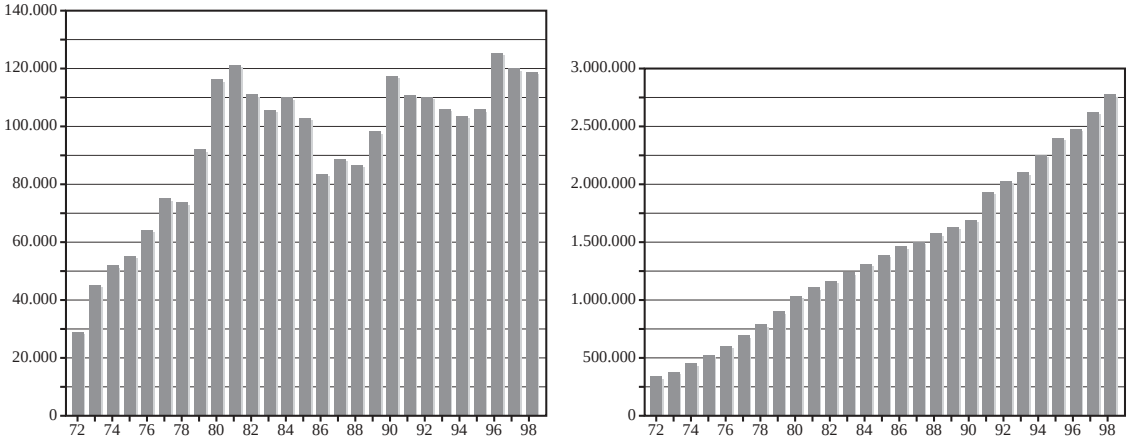


Fig. 4. UAE real GDP (mn. dh) and population (number)



The volatility of GDP during the period under study imparted volatility to per capita income (Fig. 3). The overall trend of per capita GDP is on the down side since the early eighties despite the rebounds in the oil market. This may be explained by the continued increase in the UAE population coupled with the slowdown in the economy (Fig. 4).

Sources of growth and instability

The sources of growth and instability in the evolution of the UAE economy might be traced to the development of the crude oil subsector. In fact, it is the lifeline of the UAE because economic activities, directly or indirectly, are linked with it. The direct impact of the oil subsector may be investigated through the evolution of its value added.

A. Crude Oil Value Added

The value added of the crude oil subsector fluctuated violently between 1972 and 1998. The average value added is estimated at Dh 41,705 million. Its maximum and minimum reached Dh 70,532 million and Dh 4099 million in 1980 and 1972 respectively, with a standard deviation of Dh 16,066 million. These variations are reflected in some statistics for the annual growth rates of the value added of crude oil from 1972 to1998:

- Maximum rate = 218.53 % in 1974
- Average rate = 15.79 %
- Minimum rate = – 41.46 % in 1986
- Standard deviation = 50.14 %

Figures 5 and 6 clearly show that the value added of crude oil was unstable between 1972 and 1998. The trend of value added was increasing in the sub-periods 1972–1980 and 1987–1990, and it was decreasing during the periods 1981–1986 and 1991–1998. In fact, growth rates of crude oil value added were positive in 13 years and negative in 13 years during the whole period.

Fluctuations in the value added of crude oil are exogenous to the economic policy making of the UAE. They are an outcome of international oil market development. The international oil market witnessed major changes and experienced violent fluctuations during the period 1971–1998. Crude oil prices fluctuated between US $2 and US $33 per barrel and the oil market shifted from a seller's market up to 1981 to a buyer's market for the rest of the period.[14]

Fig. 5. Evolution of UAE value added in the crude oil sub sector (mn.dh)

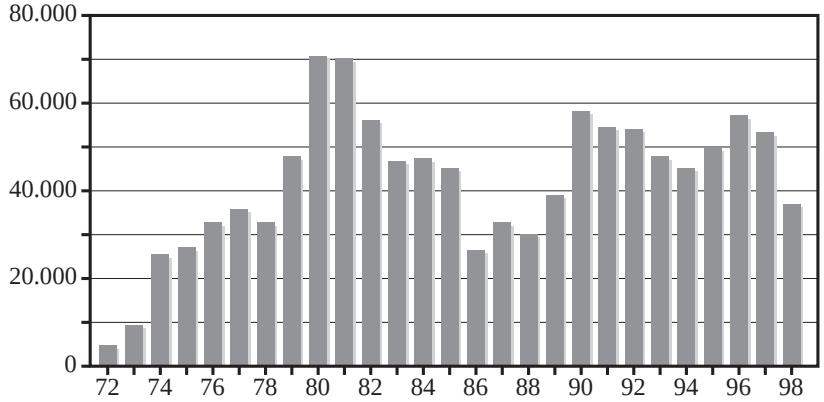
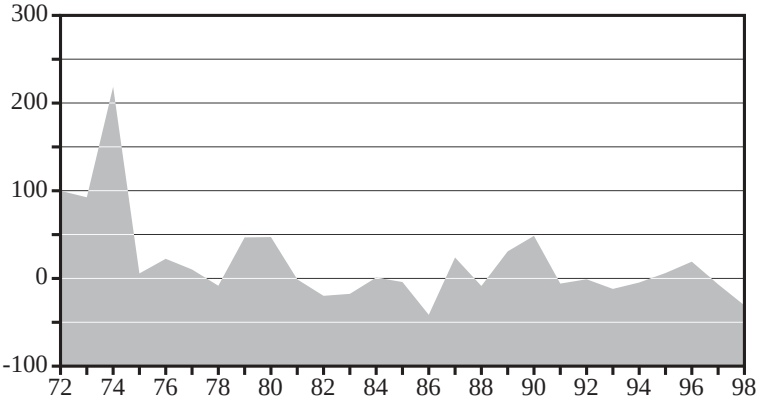


Fig. 6. UAE growth rates of value added of crude oil sector (per cent per annum)



Adjusting the GDP for crude oil contributions shows less volatility in the non-oil GDP.

B. Non-oil GDP

Non-oil GDP, christened adjusted gross domestic product (AGDP) and defined as: **AGDP = GDP–Crude Oil Value Added,** has grown by more than 56 fold during the period 1972–1998: from Dh 2351 million to Dh 113,115 million (Table 9 in the annex). AGDP experienced less volatility than GDP. Only during the period 1984–86 did it experience negative growth rates (Fig. 7). The average, maximum and minimum growth rates and standard deviations for AGDP and NGDP are presented in Table 6 below.

Table 6. Growth rates and standard deviations:
for AGDP and NGDP (1972 1998) (per cent)

	Average	Max	Min	St.d.
AGDP	19.17	116.36	–2.68	27.28
NGDP	17.25	173.20	–19.97	37.28

Source: based on Table 9 in the annex.

These variables indicate clearly that AGDP achieved a higher average growth rate with less volatility, as measured by the standard deviations, than nominal GDP (Fig. 7).

The AGDP also experienced an increasing share of GDP while that of crude oil declined from 1972 to 1998. The paths of the two shares crossed each other in 1982 (Fig. 8).

Thus, the share of non-oil GDP increased from less than 37 per cent in 1972 to more than 78 per cent in 1998 with a local peak of about 67 per cent in 1986.[15]

Table 7. Some statistics for the shares of AGDP and crude oil (per cent)

	Average	Max	Min
AGDP share	52.74	78.27	19.45
Crude Oil share	47.26	80.55	21.73

Source: based on Table 9 in the annex.

Fig. 7. UAE NGDP, crude oil value added and adjusted GDP (mn.dh)

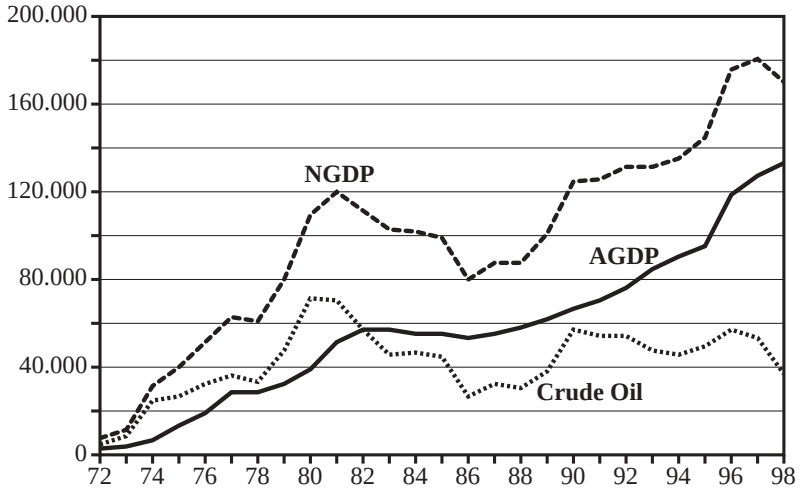


Fig. 8. UAE shares of AGDP and crude oil value added in GDP (per cent)

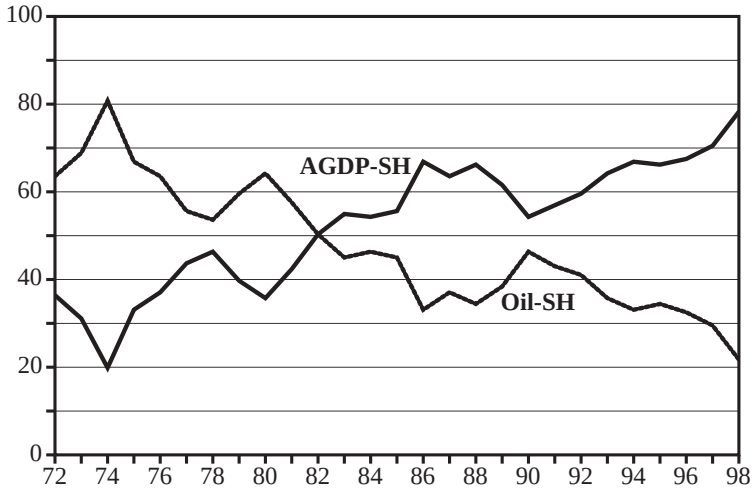
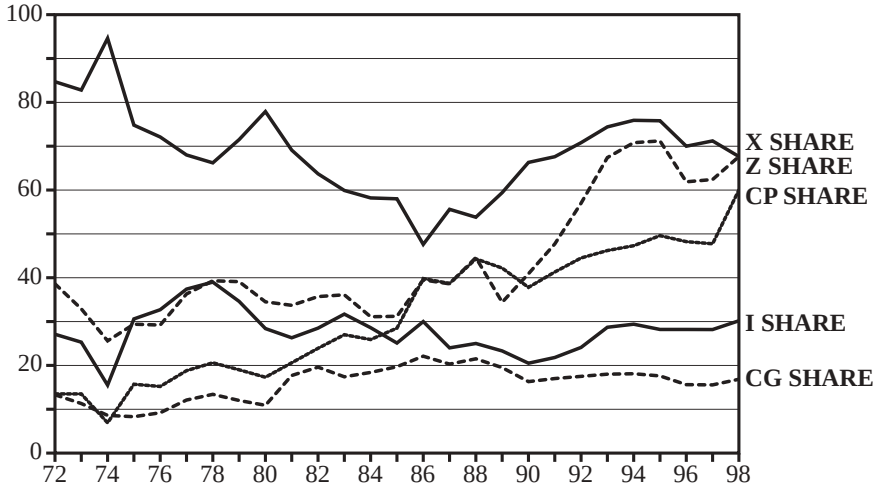


Fig. 9. UAE shares of aggregate demand components in GDP (per cent)



C. Evolution of Aggregate Demand

Another source of growth and volatility in the UAE economic activity is the evolution of aggregate demand. Aggregate demand is expenditure on GDP and may be represented as (see equation 1 and the subsequent discussion):

GDP = Cp + Cg + I + X – Z (3)

Aggregate demand is made up of two parts: domestic absorption A and net exports (X–Z).

a. shares of components of aggregate demand

Figure 9 presents the paths for the shares of private consumption (Cp), government consumption (Cg), investment (I), exports (X) and imports (Z) in GDP from 1972 to 1998. Private consumption turns out to have experienced the largest volatility compared to the other variable components of aggregate demand.

In contrast, the share of government consumption in GDP experienced the least volatility. Both exports and imports showed relatively high volatility. Table 8 presents some statistics for the evolution of the different shares in GDP.

Table 8. Some statistics for the shares of aggregate demand (1972–1998) (per cent)

	Average	Maximum	Minimum	Standard Deviation
Cp	31.40	53.31	6.91	13.94
Z	43.39	70.08	25.63	13.43
X	68.30	94.64	47.63	10.03
I	27.89	39.03	15.50	4.9
Cg	15.80	22.10	8.26	3.94

Source: based on Table 2 in the annex.

All the shares of the components except that of exports were higher in 1998 than in 1972. The Cp share was less than 15 per cent in 1972 and exceeded 53 per cent in 1998. This increase in the share of private consumption is to be expected on the basis of the increase in population from 309,243 persons in 1972 to 2,776,000 in 1998 and in per capita income (on the basis of nominal GDP) from Dh 20,857 to Dh 61,263 in the same years.[16] Also the Cg share was about 13 per cent in 1972 and reached a minimum of about 8 per cent in 1975. It increased to about 17 per cent in 1998 with a maximum of about 22 per cent in 1986. This surge in the government share in 1986 was not policy induced, but rather a result of the decline in GDP following the turmoil in the international oil market which led to the crash of oil prices to below US $13 per barrel. In contrast, the X share declined in 1986, reaching a minimum of about 48 per cent because of the negative impact of the oil market on the UAE exports which are mainly oil related.

b. growth rates of aggregate demand

On the basis of growth rates, exports (X) experienced the highest volatility, followed by private consumption, investments, government consumption and imports (Fig. 10). Table 9 presents some statistics for the growth rates of the different components of aggregate demand.

Table 9. Growth rates of the components of aggregate demand and GDP 1972–1998 (per cent)

	Average	Maximum	Minimum	Standard Deviation
X	17.91	212	–34.28	45.61
I	17.26	150	–15.47	33.77
Cp	23.13	189	–2.63	37.94
Cg	17.17	108	–19.56	28.55
Z	18.	113	–12.45	25.35
A	18.71	123	–4.39	28.62
GDP	17.25	173	–20.	37.29

Source: based on Table 2 in the annex.

The contributions of the components of aggregate demand to the growth rates of GDP may be estimated from the relation:

Growth rate of GDP =(growth rate of Cp)(share of Cp)+(growth of Cg)(share of Cg)+(growth of I)(share of I)+(growth of X)(share of X)-(Growth of Z)(share of Z).

Thus, the contributions to the average growth rate of GDP from 1972 to 1998 may be calculated as follows:[17]

(grth Cp)(share Cp) = (23.13)(31.2) = 7.22 %
(grth Cg)(share Cg) = (17.17)(15.74) = 2.7 %
(grth I)(share I) = (17.26)(27.81) = 4.8 %
(grth X)(share X) = (17.91)(68.28) = 12.22 %
(grthZ)(share Z) = (18.)(–43.39) = –7.81 %

The contributions of the components to the average growth rate of GDP are:

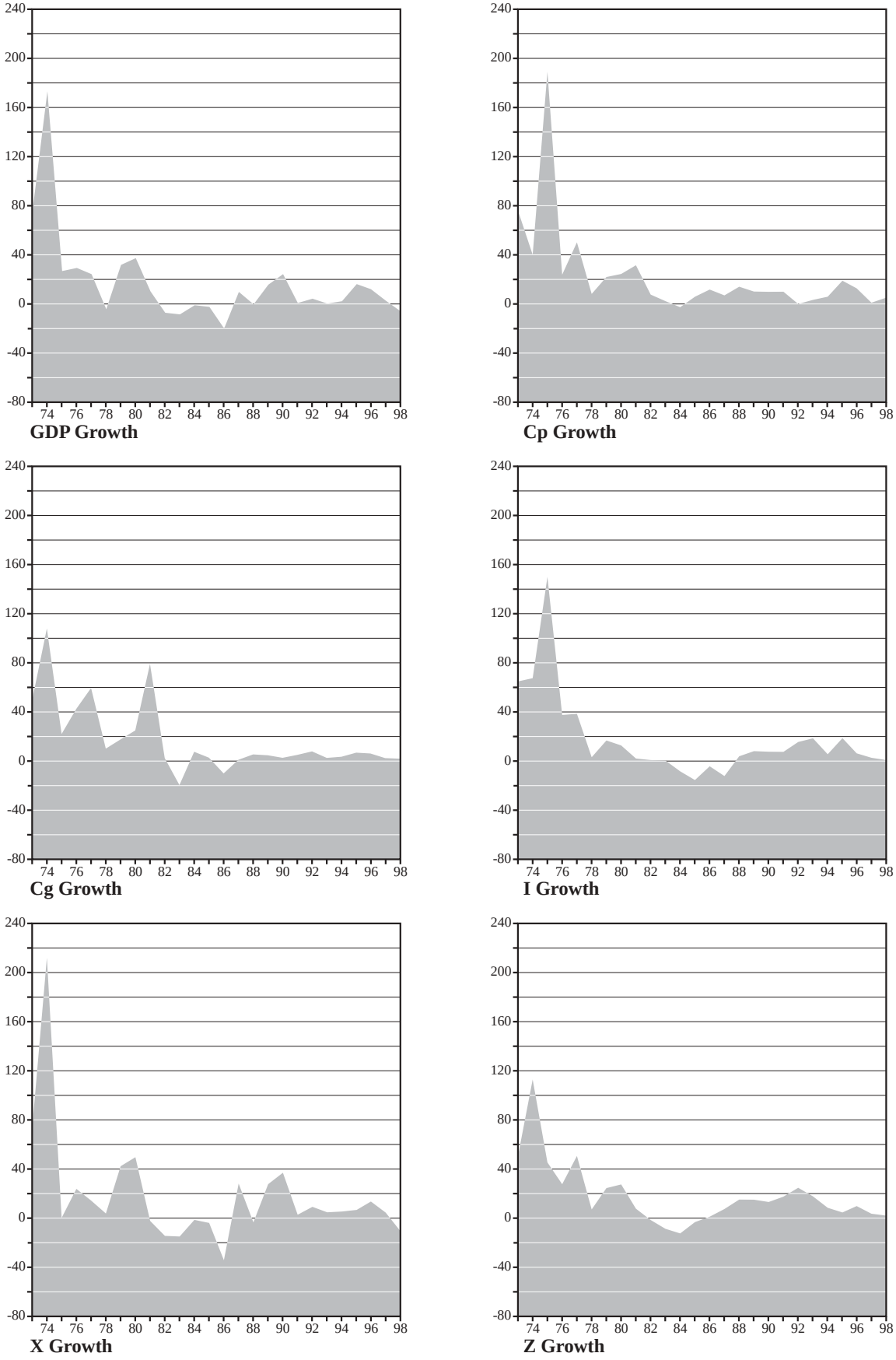
Cp: 37.72 %
Cg: 14.10 %
I: 25.08 %
X: 63.93 %
Z: –40.08 %

Exports have contributed about 64 per cent to the average growth rate of GDP from 1972 to 1998. Such a high contribution renders exports the most effective factor in shaping GDP. The export concentration index for the UAE economy is relatively high at 0.691 in 1992, although it has declined from 0.801 in 1984.[18]

Given the high contribution of X, the high export concentration index makes GDP extremely sensitive to international developments in general and to the oil market in particular. Next in importance is the import contribution to GDP growth which averaged about –40 per cent. Thus, the external sector is the mover of the UAE economy.[19]

Private consumption contributed about 38 per cent of average GDP growth while government consumption contributed about 14 per cent. This relatively low government contribution to the growth of GDP should not be interpreted as limited or implying a small government impact on overall economic activity in the UAE. In fact, the Government receives the oil revenues and spends on investments, transfers and subsidies, all activities which influence the behaviour of the private sector in its consumption and investment activities. Investment, both private and government, contributed about 25 per cent to the average growth of GDP. But the

Fig. 10. UAE growth rates of GDP and components of aggregate demand (per cent)



incremental capital output ratio (ICOR) (investment divided by the increase in GDP between two dates) on the basis of real GDP is about 4.25.

$$\textbf{ICOR} = \frac{I}{\Delta GDP} = \frac{I}{GDP} \bullet \frac{GDP}{\Delta GDP} = \text{(investment ratio x reciprocal of growth rate: } 27.81 \text{ x } 1/6.55 = 4.25\text{)}$$

This is a rough measure of the productivity of investments; the lower the number the better is the productivity. The ICOR for some groups are:[20]

- Low-income economies: 4.84
- Upper-income economies: 7.35
- High-income economies: 13.53

d. Structure of the UAE economy: production

The UAE economy, as mentioned earlier, has expanded in size by more than 264 per cent between 1972 and 1998 (Table 1 in the annex). At the beginning of the period, value added in the crude oil subsector dominated production with more than 63 per cent of total GDP. However, the UAE Government aimed, through its economic policy, to lower the country's dependence on the oil sector. Thus, when oil prices were adjusted upward in 1979/1980 for the second time, and oil revenues surged by more than 100 per cent (from Dh 24,018 million in 1978 to Dh 52,727 million in 1980), the Ministry of Planning prepared a five year plan for the period 1981–1985. The plan centred on three major issues, namely:[21]

- Optimal size and structure of population.
- Improvement in the standard of living in all regions of the UAE and development of the skills and capabilities of the citizens.
- Expansion of the productive base by increasing growth in the non-oil sectors in order to lower the dependence on the oil sector and develop non-oil sources of income.

The funding of the plan assumed constant oil revenues and about 70 per cent of the funds were to be provided by the Federal Government. However, oil revenues were down to less than Dh 35,000 million in 1982 and Dh 27,000 million in 1983. Oil market developments in the first half of the 1980s discouraged the adoption of the development plan and it was shelved. This led to uncoordinated investments in the emirates that produced over-capacity and duplication in several activities in the economy. As a result, the non-oil economy did not improve as much as was expected, though the share of non-oil GDP improved from about 50 per cent in 1982 to about 55 per cent in 1985.[22]

The agricultural sector expanded, but because of the climate of the UAE, it contributed less than 3 per cent in 1998 (Table 5 in the annex).

The manufacturing sector has expanded from 2.7 per cent of GDP in 1972 to about 12 per cent in 1998. Government services also increased its share of GDP from 4.48 per cent to 11.54 per cent in 1972 and 1998 respectively. The increase in government share is associated with the population increase (from 309,243 to 2,776,000) and the improvement in living standards. Also associated with the growth of population is the expansion in construction activity, the distributive sectors and the other service sectors.

The tremendous evolution and development that has taken place from 1972 to 1998 may not be easily quantified, evaluated and recorded. However, it may be appreciated and comprehended

through the simple, but clear and deep understanding of what the priorities of development were to the UAE President, HH Sheikh Zayed bin Sultan Al Nahyan:[23]

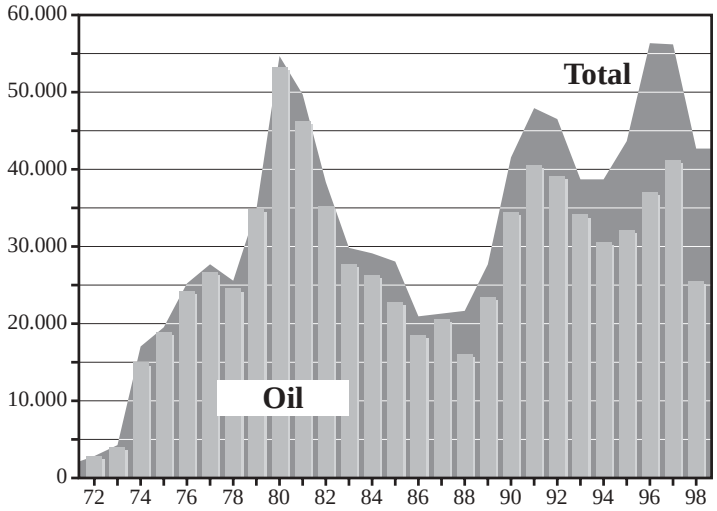
> *The first fundamental change, and the most important is the availability of drinking water. In the past, we had no drinking water here in Abu Dhabi, and we had to bring brackish water by tanker. The bringing of water was the most important. I remember telling my brother (then Ruler) that had we not got water, we would all of us have had to have moved somewhere, and to look for a place with sweet water. After that, everything started changing. Housing became available when there was none before, then infrastructure and everything else. Our policy was first to concentrate all our efforts to develop this country, and to develop its citizens. When I look around at what has been achieved, I realize I could not have imagined before that it could all have happened. It is like a dream. I had dreams, but would never have believed that it would all have been possible in such a short space of time.*

The development to which Sheikh Zayed refers can be seen and experienced through the modern cities that have been built with modern facilities, the highways, the airports, the ports, the schools and colleges, the hospitals and clinics and the afforestation of the desert, in addition to other infrastructures that support further expansion and development in the future. A quantitative assessment of this growth may be made by studying the evolution of the consolidated budget of the UAE, which is the subject of the next section.

Evolution of the Consolidated Budget

Revenues increased from Dh 2423 million in 1972 to Dh 42,690 million in 1998, an increase of more than 17 fold (1762 per cent), while total expenditures increased from Dh 1257 million to Dh 71,640 million, an increase of about 57 fold. Revenues have been shaped to a great extent by oil revenues (Table 3 annex and Fig. 11). The share of total expenditure in GDP increased from less than 20 per cent in 1972 to more than 42 per cent in 1998. The average share over the period is about 37 per cent with a maximum share of 47 per cent, a minimum share of 16 per cent and a standard deviation of 7.24 per cent.

Fig. 11. UAE total and oil revenues in the consolidated govt. budget (mn.dh)



The expansion of the government role in overall economic activities has been the result of a huge increase in government revenues and population during the period, stemming from the Government's commitment to improving the standard of living for all residents, nationals and non-nationals.

Expenditure on social services (education, health, social security, welfare, housing and community amenities) increased from 23.6 per cent in 1980 to nearly 30 per cent of total expenditure in 1996.[24] The counterpart of the financial expenditure may be appreciated through the expansion in the services of education, health and housing presented in the following Tables.

Table 10. Evolution of education in the UAE

	1974/1975	1984/1985	1994/1995
1. Students	60,254	229,759	480,973
Govt.(G)	52,790	167,320	291,143
Privt.(P)	7,464	62,439	189,830
Male	33,233	121,813	NA
Female	27,021	107,946	NA
2. Teachers	3,681	14,088	37,425
G.	3,380	10,597	24,766
P.	301	3,491	12,659
3. Schools	198	551	951
G	171	394	586
P	27	157	365
4. University Ed.			
Faculty	76	469	1,137
Students	520	5374	20,570

* 1989/1990

Sources: UAE Ministry of Planning (1987). Tables (11-15) p 314, (11-17) p 316, (11-18) p 317.
UAE Ministry of Planning (1998). *Economic and Social Development in the United Arab Emirates 1990–1995*, Tables 57 and 64, pp 128 and 136.
Gulf Cooperation Council Secretariat. *Economic Bulletin*, No. 10 (1995), Tables 2-4, p 224. 10-4, p 232.

Table 11. Percentage of the age group enrolled in education (per cent)

	Primary		Secondary		Tertiary	
	1980	1993	1980	1993	1980	1993
F	88	108	49	94		
M	90	112	55	84		
Total	74	94	71	80	3	11
Adult illiteracy rate (%) in 1995			F 20		M 21	

Source: World Bank. *World Development Report 1996*, Table 7, p 200, and *World Development Report 1998/1999*, Table 2, p 193.

The indicators on education and health services presented in these tables reflect the implication of the proverb 'action speaks louder than words' and translate the President's motto 'education is like a lantern which lights your way in a dark alley'.[25] The improvement in the status of women in the UAE is highly commendable and owes much to Her Highness Sheikha Fatima bint Mubarak, wife of the President, who emphasizes the importance of education to girls:

Table 12. Health services in the UAE

	1975	1990	1995
Hospitals	19	41	51
G	15	33	36
P	4	8	15
Beds	1745	6232	6412
G	1525	5869	6074
P	220	363	338
Doctors	751	3085	4415
G	671	1929	2742
P	80	4456	1673
Dentists	65	400	646
G	58	146	231
P	7	254	415
No. of people per			
Doctor	617	597	538
Bed	320	295	370
Nurse	258	356	274

Source: Ministry of Planning (1987). Table 11-20, p 319 (1993) Table 62, p 137.
Ministry of Planning (1998). Economic and Social Development in the United Arab Emirates, Tables 65 and 67, p 139.

Table 13. Percentage of total UAE population with access to:

	Health Care	Safe Water	Sanitation
1980	96	100	75
1993	90	100	95
Infant mortality rate (per 1000 live births)			
		1980	1994
UAE		55	16
Low income countries		87	58
Middle income countries		63	40
High income countries		12	7
World		81	53

Source: World Bank. *World Development Report 1996*, Table 6, p 198.

Table 14. Evolution of housing services in the UAE (housing units)

1975	1980	1985	1990
94,380	209,077	272,791	305,920

Source: Ministry of Planning (1987) and (1990)

'education is the real wealth which we should preserve and care for. A girl has the legal right to a proper education'.[26]

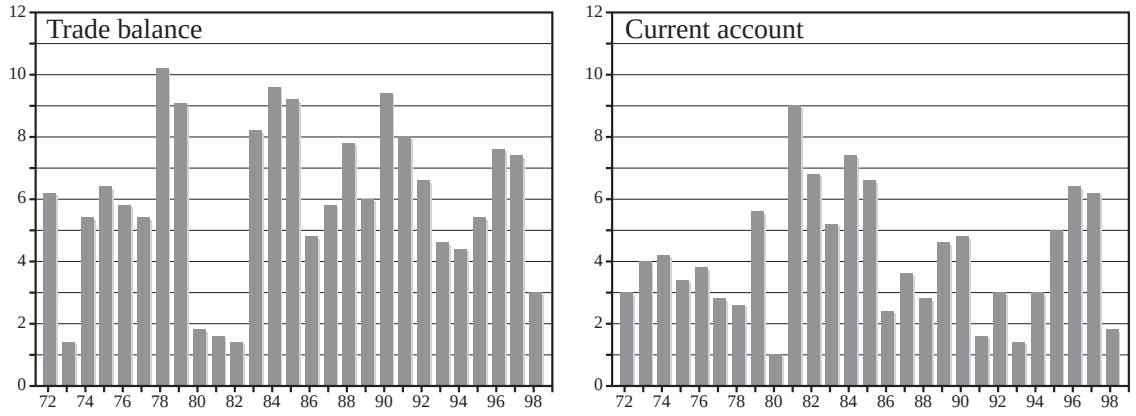
The continued expansion in the budget, despite the fall in oil revenues in the early 1980s, has resulted in an overall deficit position since 1982. The continued budget deficit has, once

again, brought the issue of dependence on the oil sector to the forefront. Charging for government services on the basis of cost recovery is being applied partially, and privatization of some utilities, water and electricity has occurred, in part, since 1998. In fact, the private sector has been encouraged to shoulder more and more economic activities. Total investment during the period 1975–1998 is estimated at Dh 721,112 million, of which Dh 203,164 million is the Government's share, the remainder being that of the private sector. The budgetary expansion, coupled with the fall in oil revenues, had a negative impact on the external sector as can be seen from its evolution between 1972 and 1998.

The External Sector

It has been mentioned before that the UAE economy has a high trade ratio and adopts a liberal trade policy. In fact, the UAE economy experienced substantial trade surpluses based on oil exports and prices. But the dependence of the economy, and especially the external sector, on development in the international oil market means that the balance fluctuates with its evolution. Trade balance fluctuated between US $1.0 billion and US $10.1 billion. The current account balance fluctuated between US $1.0 billion and US $9.20 billion during the period 1972–1998 (Fig.12).

Fig. 12. UAE trade and current account balances (bn.US dollars)



The 1980s witnessed a decline in the surplus of both the trade and current account balances. However, during the period 1990–1998, trade surplus declined from $11.14 billion in 1990 to US $5.62 billion in 1998, while the current account surplus of US $8.17 billion in 1990 declined to US $1.78 billion in 1998. Transfers, private and public, continued to realize deficits throughout the period. This result is due to two factors: one is the development assistance the UAE Government extends to Arab and other developing countries through the Abu Dhabi Fund for Development,[27] and the other is the presence of expatriates to the extent of 91 per cent of the labour force. Despite the decline of current account surplus, UAE foreign reserves were estimated at nearly US $8.12 billion in 1997 and US $8.8 billion at the end of 1998. Other assets, unofficially estimated to be much larger, are managed by the Abu Dhabi Investment Authority.[28]

Notwithstanding these foreign assets, the UAE foreign debt was estimated at US $10.88 billion at the end of 1996. Most of this (86 per cent) is in the form of short-term trade and development-related debt. Less than 3 per cent of the debt is owed to official creditors and the balance is to commercial creditors. The debt service ratio continued to decline from a peak of 13 per cent in 1984 to about 3.1 per cent by the end of 1996.[29]

Despite the fall in the current account in the balance of payments, the monetary authorities have continued to provide the economy with the liquidity it needs as reflected in the evolution of monetary and credit policy in the UAE.

Monetary and Credit Policy

The UAE Central Bank was established in 1980 to succeed the UAE Currency Board (set up in 1973) in managing the country's monetary and credit policy. It issues currency, advises the Government on monetary and financial matters, manages the country's foreign reserves and supervises the banking sector. The Central Bank overcame numerous problems to apply uniform federal laws throughout the emirates. The oil boom attracted many commercial banks to the UAE. At the end of 1998 there were 47 commercial banks, 20 of them locally incorporated with 284 branches and exchange offices and 27 foreign banks with 110 branches. In addition, there are specialized banks and investment institutions and foreign exchange offices.[30] Since 1993 all banks have had to conform to a risk weighted capital adequacy ratio of 10 per cent (two points higher than the minimum ratio of 8 per cent recommended by the Basle Committee). The Central Bank has maintained the dirham's exchange rate fixed at Dh 3.671 equal to one US dollar since 1981. From 1972 to 1980, the exchange rate appreciated from Dh 4.386 to the US dollar to Dh 3.707 to the US dollar (Table 15 in the annex). The UAE Monetary Authorities (the Board and the Central Bank) have provided the economy with the liquidity it needed. In fact, if the velocity equation paradigm is utilized:

MV = P¥RGDP = NGDP, where M = money supply, V = velocity of the circulation, P = price level, RGDP = real gross domestic product and NGDP = nominal GDP, then growth rate of M + growth rate of V = growth rate of NGDP. The following growth rates are calculated:

Table 15. Some statistics for the growth rates of GDP, M1 and M2 (per cent)

	NGDP	M1	M2
Average	17.25	16	19.88
Maximum	173.2	81.92	167.25
Minimum	–19.96	–6.36	–8.23
Standard Deviation	37.29	21.85	36.56

Source: based on Tables 1 and 15.

Growth rate of narrow money (M1 = Currency outside the banks and demand deposits) is close to the nominal growth rate of GDP, which implies that V was stable. In fact, since 1986 it was almost constant. This was associated with low or no inflation. In conclusion, one could infer that monetary policy was accommodating to economic activity.

Conclusion

Prior to December 1971, the United Arab Emirates was characterized politically as seven separate emirates under British protection, economically as separate and underdeveloped entities and socially as backward and lacking essential and basic needs in the areas of education, health and housing services. Today, by contrast, having made major strides politically, economically and socially, it can boast of being in the company of high-income countries on both the Human Development Index and by GDP Index criteria.[31]

Notwithstanding these achievements, the UAE continues to face at least two challenges. First is the issue of economic diversification and the development of non-oil income sources. Although the share of non-oil income (AGDP) has continued to increase and has, since 1982, surpassed the oil share, the linkages and dependence of the former on the latter is large. Thus, recession in the oil sector has a negative impact on the overall performance of the non-oil GDP.

The other challenge is the high percentage share of expatriates in the size of the population and consequently in the labour force. Careful and prudent considerations are essential elements for any intelligent discussion on the issue. Concepts need to be defined and understood and historical and present experiences of other countries (USA, Canada, Australia and others) should be studied before taking decisions on this issue as it is not a social one only, but is first and foremost an economic problem.

[1] The Economist Intelligence Unit estimates non-nationals at 80 per cent, EIU, *Country Profile, United Arab Emirates 1998–1999*, p 7.

[2] Dr Abdallah, Matar A. *Disequilibrium in the United Arab Emirates Population Structure and Approaches to Correct it*, Al Sharjah (1999) p 57.

[3] In 1997 the weighted average of gross national product (GNP) per capita for the middle-income economies was US $1890 and that of the upper-middle income was US $4520. However, the weighted average of GNP per capita for the high-income economies was US $25,700. The highest GNP per capita was that of Switzerland at US $44,320. Although the UAE is a member of the high-income economies according to the World Bank classification, its per capita GNP is less than 65 per cent of the group average and only about 38 per cent of that of Switzerland. See World Bank, *World Development Report 1998/99*, Table 1, p 190.

[4] UAE Central Bank**,** *Annual Report 1998*, Table 2–15, p 37 and Table 2-7, p 26.

[5] Al Sadik (1985) p 86–7.

[6] Al Shamsi (1995) chapters 1–5.
Peck (1986) p 92.

[7] Al Shamsi, *op. cit.*, p 55 and p 60.

[8] *Ibid.* Table 17, p 187.

[9] Average government take increased from US $0.89 per barrel in late 1970 to about US $9.79 per barrel in October 1975. See Al Sadik (1984), Table 2, p 20.

[10] UAE Monetary Agency, *Annual Report*, 31 December (1979) p 231.

[11] UAE Ministry of Planning, *Main Aspects of Economic and Social Development in the United Arab Emirates during 1972–1977*, May (1978) pp 3–2.

[12] The President, Sheikh Zayed, is quoted as having said, 'The federation has embodied the hopes and aspirations of the UAE people for a good life, and represents the start of a great leap forward that will permit us to catch up with civilization in the rest of the world.' see *UAE Yearbook 1995*, p 19.

[13] In the development literature, two constraints on development in the developing countries are the two gaps, the foreign exchange gap (insufficient foreign earnings) and the saving-investment gap (saving less than investment).

[14] For a review of the changes in the international oil market see Seymour (1980).

[15] In 1986 the oil market witnessed the lowest prices since their adjustments in 1973/1974. The nominal average oil price declined to less than US $13 per barrel, Table 14 in the annex.

[16] In theory real income should be considered assuming no income illusion. In fact per capita income (real GDP) declined from Dh 92,332 in 1972 to Dh 42,808 in 1998 (Table 12 in the annex). On the real income basis the income effect on the share of consumption is negative. However, the positive effect of the increase in population on Cp exceeded the negative effect of the decline in income on Cp.

[17] Numbers are taken from Tables 8 and 9 in the text. The sum of these contributions are not exactly equal to the growth rate of GDP reported in Table 9 due to rounding and not allowing for net indirect taxes.
[18] Export concentration index measures the degree to which a country's exports are concentrated in, or diversified among SITIC (revision 2) three-digit level commodities. The index is calculated using Hirschman methodology: Ix = Â(Xi/X)^2, Xi/X is share of exports of commodity Xi in total exports X with a maximum concentration index equal one. See World Bank (1996) pp 192 and 226.
[19] The high degree of openness of the UAE economy to the international economies as measured by the trade ratio is a very good reason for the UAE Government to continue its oil policy aiming at stability in the international oil market.
[20] On the basis of average growth rates of GDP over the period 1990–1994 and investment /GDP ratio in 1994, World Bank (1996) Table 11 p 208 and Table 13 p 212.
[21] Ministry of Planning (1987) p 175.
[22] Between 1981 and 1988, GDP was trending downward and in 1989 its level was less than in 1981, see Table 1 in the annex.
[23] *UAE Yearbook 1995*, p 19.
[24] World Bank, *World Development Report: Knowledge for Development, 1998/1999*, p 217.
[25] *UAE Yearbook*, op. cit., p 99.
[26] *Ibid.* p 99.
[27] The Fund was established in July 1971, as The Abu Dhabi Fund for Arab Economic Development, and in 1993 changed its name to Abu Dhabi Fund for Development to reflect the actual emphasis on extending aid throughout the developing countries.
[28] The cumulative surpluses of the current account from 1980 to 1998 amounted to about Dh 307 billion (approximately US $84 billion) in foreign assets before adding any derived interest or other income.
[29] EIU. *United Arab Emirates: Country Profile 1998–1999*, p 34.
[30] UAE Central Bank. *Annual Report, 1998*, pp 47–48.
[31] United Nation Development Programme (UNDP), *Human Development Report 1998*, p 21.

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Table 1. UAE nominal, real and GDP deflator (1987=100)			Million dirhams
	NGDP	RGDP	GDPDEF
1972	6450.2	28553.34	22.59
1973	11392.1	44552.6	25.57
1974	31122.7	51079.44	60.93
1975	39460	54427.59	72.5
1976	51033	63198.76	80.75
1977	63419	73932.15	85.78
1978	60669	72570.57	83.6
1979	79972	90671.2	88.2
1980	109833	114433.2	95.98
1981	121100	119486.9	101.35
1982	112433	109317.5	102.85
1983	102909	104085.2	98.87
1984	101843	108366.7	93.98
1985	99416	101331.2	98.11
1986	79566	82281.28	96.7
1987	87366	87366	100
1988	87106	85322.75	102.09
1989	100781	96793.12	104.12
1990	125266	115708.5	108.26
1991	126264	109158.8	115.67
1992	131676	108384.2	121.49
1993	132116	104315.8	126.65
1994	135065	105105	128.5048
1995	156902	113565	138.1605
1996	175778	125368	140.2096
1997	180630	119996	150.53
1998	170066	118836	143.1098

Sources: For GDP, UAE Ministry of Planning 1. *Main Features of Economic and Social Development in the United Arab Emirates 1972-1977*, May 1978. 2.*Main Features of Economic and Social Development in the United Arab Emirates 1975-1980.* 3.*Main Features of Economic and Social Development in the United Arab Emirates 1990-1995*, 1998. 4. *Main Features of Economic and Social Development in the United Arab Emirates 1990-1995*, 1998. 5. *Annual Economic Reports*, 1994, 1995, 1996, 1997, 1998.

Table 2. UAE Components of aggregate demand					Million dirhams
	Cp	Cg	I	X	Z
1972	871.6	859.2	1747.7	5464.8	2493.1
1973	1535.5	1284.8	2880.6	9438.5	3747.3
1974	2150.4	2671.9	4824.7	29453.5	7977.7
1975	6215	3261	12059	29522	11597
1976	7695	4648	16585	36557	14802
1977	11557	7413	22966	41779	22296
1978	12501	8163	23679	40200	23874
1979	15245	9600	27643	57201	29717
1980	18968	11992	31155	85592	37874
1981	24946	21475	31801	83662	40784
1982	26846	22000	32063	71576	40152
1983	27467	17696	32193	60874	36665
1984	26744	19030	29496	60008	32101
1985	28317	19554	24933	57672	31060
1986	31640	17581	23872	37901	31428
1987	33852	17762	20956	48562	33766
1988	38605	18722	21770	46879	38870
1989	42510	19603	23526	59853	44711
1990	46717	20120	25314	81978	50590
1991	51376	21131	27210	84246	59444
1992	57921	22792	31435	92000	74148
1993	59849	23377	37259	96380	87298
1994	63314	24197	39324	101574	94656
1995	75303	25850	46655	108374	99038
1996	84880	27442	49584	123039	108761
1997	86232	28100	50907	128613	112673
1998	90662	28640	51334	115030	115000

Sources: For GDP UAE Ministry of Planning. 1. *Main Features of Economic and Social Development in the United Arab Emirates, 1972-1977*, May 1978. 2. *Economic and Social Development in the UAE, 1975-1985*, 1987. 3.*Economic and Social Development in the UAE, 1985-1990,*1993 *Annual Economic Reports*, 1994, 1995, 1996, 1997, 1999.

Table 3. UAE consolidated government fiscal accounts **Million dirhams**

	Tot. Rev.	Cur. Exp.	Cap. Exp.	Tot. Exp.	Oil Rev.
1972	2423.9	934.7	NA	1256.8	2194
1973	3699.1	1327.6	NA	2554.2	3166
1974	16466.3	2841.2	NA	5029.6	14041
1975	19033	4044	4075	13364	18025
1976	24766	5703	6761	18562	23484
1977	27347	7713	10332	24476	26116
1978	25489	8895	11391	26250	24018
1979	34653	10693	10154	29617	34265
1980	54550	16763	9593	39811	52727
1981	49617	24604	9207	46082	45480
1982	37729	25818	9756	42723	34643
1983	29539	24384	8096	38119	27005
1984	28800	24075	6817	33997	25631
1985	27762	24535	6534	34389	22247
1986	20397.8	23706.7	7400.8	34896.2	17855
1987	20683.4	31723.1	4492.6	37517	20042
1988	20793.5	31048.4	3596.2	36176.5	15425
1989	27367.5	32459.5	4229.7	38105.6	22934
1990	41277.9	34475.4	4758.1	53461.8	34034
1991	47833	33051	7171	59456	39915
1992	46154.9	39098.2	9269.6	52132.9	38412
1993	38517.2	38468.7	10910.4	54616.1	33243
1994	38664	38103	11737	54792	29894
1995	43654	43593	11945	61857	32033
1996	56350	58846	10193	73825	37007
1997	56192	48002	10842	64391	41140
1998	42690	50482	13903	71640	25501

Sources: 1.*UAE Central Bank: Annual Reports* (1993,1994, 1995, 1997, 1998) 2. Bulletin(1991) UAE Ministry of Planning: *Main Features of Economic and Social Development 1972-1977*, (1978).

Table 4. UAE number of employees and their compensation

	Workers	Wages	Wage per worker
	Number	Mn. Dh.	Dirhams per year
1972	144770	1256.7	8680.666
1973	182850	2524.2	13804.76
1974	234380	5103.9	21776.18
1975	288414	5633	19530.95
1976	383983	8138	21193.65
1977	477301	11442	23972.29
1978	494485	12617	25515.44
1979	523240	14166	27073.62
1980	541033	16011	29593.39
1981	578810	21123	36493.84
1982	592530	23300	39322.9
1983	600418	24297	40466.81
1984	607682	24573	40437.27
1985	619429	24997	40354.91
1986	621822	24007	38607.51
1987	624746	24426	39097.49
1988	643669	25226	39190.95
1989	667246	26784	40141.12
1990	694201	28019	40361.51
1991	737690	29883	40508.89
1992	799427	31904	39908.58
1993	859717	34484	40110.87
1994	912929	36242	39698.6
1995	955100	38000	39786.41
1996	1274000	47889	37589.48
1997	1330000	50201	37745.11
1998	1378000	51804	37593.61

Sources: Ministry of Planning: 1. *Main Features of Economic and Social Development in the United Arab Emirates: 1972-1977* (1978), 1975-1985 (1993), 1990-1995 (1998). 2. *Annual Economic Reports:* 1994, 1995, 1996, 1997, 1998.

Table 5. UAE labour force distribution between sectors and GDP at factor cost by economic sectors in 1998

Sector	Labour Number	GDP at current prices Mn. Dh.	Labour share: % of total labour	Sector's share: % of total GDP
Agriculture	101800	5834	7.38	3.43
Mining				
Crude Oil	21900	36951	1.59	21.73
Others	3700	635	0.27	0.37
Manufacturing	173800	20190	12.61	11.87
Electricity& Water	23935	4140	1.74	2.43
Construction	255800	16243	18.56	9.55
Whole Sale	234700	20490	17.03	12.05
Transportation	98710	12310	7.16	7.24
Finance, Insurance & Real Estate				
Finance and Insurance	20866	11030	1.51	6.49
Real Estate & Business Services	35440	18210	2.57	10.71
Other Services	116300	6690	8.44	3.93
Government	153659	19700	11.15	11.58
Domestic Services of households	137880	1487	10.00	0.87
Less imputed bank services		3844		
Total	**1378490**	**170066**	**100.00**	**100.00**

Source: UAE Ministry of Planning, *Annual Economic Report* 1999, Tables 3 and 9.

Table 6. UAE oil revenues (mn.US $)

1972	551
1973	900
1974	5536
1975	6000
1976	7000
1977	9030
1978	8000
1979	12400
1980	19200
1981	18306
1982	14465
1983	11441
1984	12400
1985	12500
1986	6100
1987	4560
1988	4141
1989	11300
1990	15600
1991	14765
1992	14490
1993	12086
1994	12300
1995	13350
1996	14980
1997	15270
1998	10260

Sources: 1970 1978 Bryan Cooper, (ed), *Opec Oil Report* London. *Petroleum Economist*, 2nd Edition, 1978
1978 1982, *Petroleum Economist*, June 1981 and 1983
1983-1995. OAPEC,. *Secretary General Annual Report*, Various numbers.

Table 7. UAE oil production (mn.barrels)

1972	440.2
1973	555.6
1974	611.6
1975	619.077
1976	708.88
1977	729.51
1978	667.77
1979	667.5
1980	626.39
1981	548.8
1982	460.79
1983	451.58
1984	468.78
1985	477.8
1986	500.05
1987	542.025
1988	571.23
1989	706.64
1990	774.89
1991	883.3
1992	835.85
1993	792.05
1994	788.4
1995	788.4
1996	788.4
1997	788.66
1998	831.47

Sources: *Petroleum Economist*, Various issues,
OAPEC,*Secretary General Annual Report*, 1998.

Table 8. UAE value added in the crude oil sector (mn.dh.)	
1972	4099
1973	7870
1974	25070
1975	26364
1976	32275
1977	35575
1978	32618
1979	47884
1980	70532
1981	69814
1982	55982
1983	46145
1984	46604
1985	44707
1986	26171
1987	32423
1988	29643
1989	38792
1990	57632
1991	54260
1992	53753
1993	47341
1994	45154
1995	47949
1996	57123
1997	53314
1998	36951

Sources: UAE Ministry of Planning, *Main Features of Economic and Social Development in the United Arab Emirates 1972-1977*, 1978, 1975-1985 (1987), 1985-1990 (1993), 1990-1995 (1998)). *Annual Economic Reports* 1994, 1996, 1997, 1999.

Table 9. UAE GDP, Oil GDP and AGDP (mndh)			
	AGDP	OILGDP	NGDP
1972	2351	4099	6450
1973	3522	7870	11392
1974	6053	25070	31123
1975	13096	26364	39460
1976	18758	32275	51033
1977	27844	35575	63419
1978	28051	32618	60669
1979	32088	47884	79972
1980	39301	70532	109833
1981	51286	69814	121100
1982	56451	55982	112433
1983	56764	46145	102909
1984	55239	46604	101843
1985	54709	44707	99416
1986	53395	26171	79566
1987	54943	32423	87366
1988	57463	29643	87106
1989	61989	38792	100781
1990	67634	57632	125266
1991	72004	54260	126264
1992	77923	53753	131676
1993	84775	47341	132116
1994	89911	45154	135065
1995	108953	47949	156902
1996	118655	57123	175778
1997	127316	53314	180630
1998	133115	36951	170066

Source: based on Tables 1 and 8 in the annex.

Table 10. UAE population (number)	
1972	309243
1973	364164
1974	428839
1975	505000
1976	580669
1977	667669
1978	767708
1979	882736
1980	1015000
1981	1079159
1982	1147375
1983	1219902
1984	1297014
1985	1379000
1986	1433001
1987	1489118
1988	1547432
1989	1608029
1990	1671000
1991	1908800
1992	2011400
1993	2083100
1994	2230000
1995	2411000
1996	2479000
1997	2624000
1998	2776000

Sources: UAE Ministry of Planning, *Annual Economic Reports*, *Economic and Social Development in the United Arab Emirates 1972-1997*, 1975-1985, 1990-1995.

Table 11. UAE per capita real GDP (dirhams per year)	
1972	92333
1973	122342
1974	119111
1975	107777
1976	108838
1977	110732
1978	94529
1979	102716
1980	112742
1981	110722
1982	95276
1983	85323
1984	83551
1985	73482
1986	57419
1987	58670
1988	55138
1989	60194
1990	69245
1991	57187
1992	53885
1993	50077
1994	47132
1995	47103
1996	50572
1997	45730
1998	42808

Source: based on Tables 1 &10.

Table 12. UAE GDP structure by origin **(% of GDP)**

	1972	1975	1980	1985	1990	1995
Agriculture	1.8	0.008	0.007	1.41	1.64	2.47
Mining						
Crude Oil	63.49	66.52	63.27	43.83	46.01	34.17
Others	0.001	0.002	0.002	0.003	0.002	0.003
Manufacturing	2.73	0.009	3.76	9.07	7.74	8.68
Electricity& Water	1.3	0.005	1.16	2.1	1.96	2.23
Construction	6.33	10.87	8.82	8.71	7.73	9.24
Whole Sale	7.6	8.19	8.16	8.54	8.97	12.36
Transportation	7.38	3.17	3.35	4.14	4.95	5.9
Finance, Insurance & Real Estate						
Finance and Insurance	0.007	1.58	1.9	5.05	4.09	4.96
Real Estate & Bus. Ser.	3.72	4.02	3.59	5.08	5.48	8.13
Other Services	0.005	0.009	0.007	1.61	1.97	1.14
Government	4.48	3.44	5.37	10.78	10.35	11.34
Domestic Services	0	0.001	0.002	0.004	0.004	0.008
Less imputed bank services	0	-1.39	-1.26	-1.01	-1.57	-1.77
Total	**6450**	**39635**	**111470**	**101990**	**125266**	**143970**
Non-Oil Sectors	2355	13271	40938	57283	67634	94770
% of total	36.51	44.57	36.24	56.17	53.99	65.83

Sources: UAE Ministry of Planning, *Annual Economic Reports, Economic and Social Development in the United Arab Emirates 1972-1997*, 1975-1985, 1990-1995.

Table 13. UAE nominal and real oil prices **US $ per barrel**

	Index 72	Index 95	Nominal	Real 72	Real 95
1970	85.19	23	2.1	2.47	9.13
1971	92.59	25	2.57	2.78	10.28
1972	100.00	27	2.8	2.80	10.37
1973	122.22	33	3.14	2.57	9.52
1974	148.15	40	10.41	7.03	26.03
1975	166.67	45	10.43	6.26	23.18
1976	166.67	45	11.63	6.98	25.84
1977	181.48	49	12.6	6.94	25.71
1978	203.70	55	12.91	6.34	23.47
1979	233.33	63	29.19	12.51	46.33
1980	266.67	72	36.01	13.50	50.01
1981	255.56	69	34.17	13.37	49.52
1982	244.44	66	31.71	12.97	48.05
1983	240.74	65	30.05	12.48	46.23
1984	233.33	63	28.06	12.03	44.54
1985	229.63	62	27.52	11.98	44.39
1986	266.67	72	12.97	4.86	18.01
1987	296.30	80	17.73	5.98	22.16
1988	318.52	86	14.24	4.47	16.56
1989	318.52	86	17.31	5.43	20.13
1990	344.44	93	22.26	6.46	23.94
1991	344.44	93	18.62	5.41	20.02
1992	351.85	95	18.44	5.24	19.41
1993	333.33	90	16.33	4.90	18.14
1994	344.44	93	15.54	4.51	16.17
1995	370.37	100	16.86	4.55	16.86
1996	359.30	97	23.3	5.65	20.9
1997	329.70	89	18.7	5.67	21
1998	314.80	85	12.3	3.91	14.5

Sources: OAPEC. *Secretary General Annual Report 1995*, table1-18, p. 7. *Secretary General Annual Report 1998*, table1-16, p. 45.

Table 14. UAE dirham exchange rate

	(dirhams per US $)
1972	4.386
1973	3.996
1974	3.959
1975	3.961
1976	3.953
1977	3.903
1978	3.871
1979	3.816
1980	3.707
1981	3.671
1982	3.671
1983	3.671
1984	3.671
1985	3.671
1986	3.671
1987	3.671
1988	3.671
1989	3.671
1990	3.671
1991	3.671
1992	3.671
1993	3.671
1994	3.671
1995	3.671
1996	3.671
1997	3.671
1998	3.671

Source: IMF. *International Financial Statistics*, June 1999.

Table 15. UAE narrow M1 and broad money M2 in mndh and their growth rates in per cent

	GRTHM1	GRTHM2	M1	M2
1972	NA	NA	NA	NA
1973	NA	NA	970.00	2,260.00
1974	58.76	167.26	1,540.00	6,040.00
1975	68.83	45.70	2,600.00	8,800.00
1976	81.92	90.91	4,730.00	16,800.00
1977	10.15	-7.74	5,210.00	15,500.00
1978	10.94	13.55	5,780.00	17,600.00
1979	8.48	3.41	6,270.00	18,200.00
1980	17.22	29.12	7,350.00	23,500.00
1981	22.04	23.83	8,970.00	29,100.00
1982	8.58	15.46	9,740.00	33,600.00
1983	-6.37	8.04	9,120.00	36,300.00
1984	-2.52	29.20	8,890.00	46,900.00
1985	6.97	6.40	9,510.00	49,900.00
1986	-3.26	4.41	9,200.00	52,100.00
1987	9.78	5.37	10,100.00	54,900.00
1988	6.93	6.01	10,800.00	58,200.00
1989	2.78	8.59	11,100.00	63,200.00
1990	-2.70	-8.23	10,800.00	58,000.00
1991	20.37	14.48	13,000.00	66,400.00
1992	15.38	4.67	15,000.00	69,500.00
1993	21.33	-1.58	18,200.00	68,400.00
1994	5.49	7.89	19,200.00	73,800.00
1995	8.33	10.30	20,800.00	81,400.00
1996	7.07	6.87	22,270.00	86,990.00
1997	13.92	9.05	25,370.00	94,860.00
1998	9.50	4.17	27,780.00	98,820.00

Sources: *UAE Central Bank, Annual Reports*, Various issues.

Oil and Gas in the UAE

Gerald Butt

Introduction

The prosperity of the United Arab Emirates and its rapid transformation from a backward desert region to one with a booming economy have been made possible by revenue from oil exports. The UAE possesses nearly 10 per cent of the world's total reserves, and there is no doubt that oil will continue to provide the income for both economic growth and the expansion of social services for several more decades at least. In the coming years, natural gas will play an increasingly important role in the UAE's development – particularly as a fuel source for power generation, petrochemicals and manufacturing industry. The UAE has also taken the initiative in developing an intra-Gulf gas network that could eventually link up with the Indian subcontinent.

Early in 2000, the UAE marked the fiftieth anniversary of the drilling of the first oil well at Ra's Sadr, north-east of Abu Dhabi. It was an inauspicious start for the oil industry, because the well proved to be dry. Not for another decade were major discoveries made, although the Trucial States (the areas which became the UAE in 1971 after the British withdrew from the Gulf) swiftly made up for lost time. In a matter of a few decades, Abu Dhabi, supported by Dubai, turned the UAE into one of the major players in the international oil export industry. Proven recoverable oil reserves in 2000 were put at 98.8 billion barrels. At the same time, proven recoverable reserves of natural gas in the UAE were estimated in 2000 at 6 trillion cubic metres, or 4 per cent of the world total. This makes the UAE's gas reserves the third largest in the Middle East (after Iran and Qatar) and the fourth largest in the world (with Russia holding the biggest reserve), although – as will be explained later in the chapter – gas production in Abu Dhabi is never likely to be as economical as in some other Gulf states.

The Development of Abu Dhabi's Oil Industry

By far the biggest deposits of oil in the Emirates have been found in Abu Dhabi. The emirate controls more than 85 per cent of the UAE's oil output capacity and more than 90 per cent of its reserves. As oil exports began in the late 1950s and early 1960s, it was still a largely undeveloped desert emirate inhabited by nomads, pearl divers and fishermen. The ruler's fort was the only building of substance on Abu Dhabi island, the site of the city today. There were

no roads or basic amenities. Expatriate workers from Bahrain or Kuwait – where the petroleum industry was much more advanced – were flown in on small aircraft which landed on runways of flattened sand mixed with oil. In 1966, when Sheikh Zayed bin Sultan Al Nahyan became ruler, there were fewer than 20,000 people living in Abu Dhabi.

At the beginning of the twenty-first century, Abu Dhabi, with a population of around 600,000, boasts a Manhattan-style skyline with high-rise buildings rising out of a city with tree-lined streets, and spacious parks and gardens. It is by far the cleanest and environmentally friendliest city in the region. Against the background of a carefully managed oil and gas industry, the UAE as a whole enjoys a high standard of living with public services and amenities as advanced as any in the world.

While the Emirates were late starters in the oil export business, the idea that there might be oil under their deserts had taken root just before the outbreak of the Second World War in 1939. This was a period of British domination of the Gulf region. Under treaties signed with most of the sheikhdoms, including Abu Dhabi, the British government, through its Political Resident based in Bahrain, had the right to approve or reject the awarding of oil concessions in the Gulf. This was part of Britain's policy of protecting the route to India by making sure that no other foreign power could get a foothold in the region. It is no surprise, therefore, that British companies played a leading role in the development of the oil industry in Abu Dhabi and other Gulf sheikhdoms. A 75-year concession for all the onshore oil rights in Abu Dhabi was awarded to the Petroleum Development Company (Trucial Coast), a subsidiary of the Iraq Petroleum Company (IPC), itself a joint venture of several oil majors, including BP, Shell, Total, Exxon and Mobil. During the Second World War, all exploration work in Abu Dhabi, as in the rest of the Gulf, was put on hold, and after the war, efforts were focused more on Qatar, Bahrain and Kuwait than on Abu Dhabi. In 1953, the D'Arcy Oil Company acquired Abu Dhabi's offshore concession, passing it on two years later to Abu Dhabi Marine Areas (ADMA), owned initially by British Petroleum (BP) and Compagnie Française des Petrole (CFP – which became Total). In 1958, ADMA became the first company to discover oil in commercial quantities – at Umm Shaif close to Das Island. A production and processing centre and an oil export terminal were built on the island. Crude began to be shipped from Das Island in 1962 – the year when Abu Dhabi joined the family of oil exporters and the rapid transformation of the emirate began.

Also in 1958, Petroleum Development (Trucial Coast) discovered the onshore Bab oilfield, following up with the discovery of the Bu Hasa field in 1962. In that year the company changed its name to the Abu Dhabi Petroleum Company (ADPC), agreeing at the same time to give up parts of its concession every two years thereafter.

In its first year of oil production (1962), Abu Dhabi produced 14,200 barrels per day (b/d) of oil. The following year, production rose by a staggering 239.4 per cent to 48,200 b/d and by an even bigger jump (287.6 per cent) to 186,800 b/d in 1964.

ADMA's success continued in 1965 with the discovery of the offshore Zakum oilfield. Exports began two years later. Subsequently ADMA kept only part of the field (Lower Zakum), with the Zakum Development Company (ZADCO) – owned by the Abu Dhabi National Oil Company (ADNOC), 88 per cent and the Japan Oil Development Company (JADOC), 12 per cent – taking over the rest (Upper Zakum). In 1968, a third concessionary company, Abu Dhabi Oil Company (ADOC), was formed. Established by Maruzen Oil Company, Daikyo Oil Company and Nippon

Mining Company, it was awarded a 45-year offshore concession for a 4416 sq. km tract relinquished by ADMA. Oil was struck in September 1969 on the island of Mubarraz. ADOC brought the field on stream in 1973. Today its shareholders are: Cosmo Oil, 51 per cent; Japan National Oil Corporation, 17.8 per cent; other Japanese companies, 5.5 per cent.

After the ending of the Trucial States' treaties with Britain and the creation of the UAE in 1971, the Abu Dhabi National Oil Company (ADNOC) was set up – to manage and operate all aspects of the emirate's oil and gas industry. ADNOC acquired a 25 per cent stake in both ADPC and ADMA. In a further change, BP sold a 45 per cent stake in ADMA to a Japanese consortium, Japan Oil Development Company (JODCO). On 1 January 1973, ADNOC increased its stake in ADPC and ADMA to 60 per cent. Nevertheless, Abu Dhabi was the only Gulf oil producer to retain foreign partners on a production-sharing basis, rather than have the national oil company acquire 100 per cent control of oil operations. Today, oil companies from Japan, France, the United Kingdom, the United States and elsewhere own up to 40 per cent of the energy sector in the emirate. The decision to limit state control of the companies to 60 per cent was taken with a realization on the part of the emirate that its oil industry would benefit from the advances in technology and the depth of expertise which international majors could bring. The decision paid off – giving Abu Dhabi a technological edge over fellow-producers in the Gulf, some of which (notably Kuwait and Saudi Arabia) were realizing, as the new century dawned, that their own industries needed outside expertise to help in developing oil and gas production and in incorporating the latest technology in their industries.

Back in the early 1970s, further adjustments were made to the structure and identity of companies operating in Abu Dhabi followed the government's decision that ADNOC should take 60 per cent stakes in the two major ones. On 2 April 1977, ADMA was renamed the Abu Dhabi Marine Operating Company (ADMA-OPCO) and designated as the emirate's offshore operator. The shareholdings were unchanged: ADNOC (60 per cent); BP (14.66 per cent); Total (13.33 per cent); and JODCO (12 per cent). Offshore production continued steadily over the next two decades, and in 1997, ADMA-OPCO awarded a gas injection project for the Zakum field to enhance oil recovery. The field was already equipped with extensive water injection facilities for pressure maintenance purposes. A new compression platform and injection network was built to deliver the gas to the injection wellheads. The compression platform incorporates three compression trains capable of handling a total of 300 million cubic feet daily (mn cfd). A pipeline system delivers gas to five existing wellheads operated by ADMA-OPCO and ZADCO. The existing wellheads were modified to accommodate the required injection wells and pipeline tie-in facilities, serving both the Upper Zakum and Lower Zakum oil reservoirs. In February 2000, the Japan National Oil Corporation (JNOC) and ADNOC signed a memorandum of understanding to cooperate in research and in raising oil production capacity in the emirate. Abu Dhabi's main offshore oilfields are Umm Shaif, Lower Zakum, Upper Zakum, al-Bunduq and Abu al-Bukhoosh.

On 20 September 1978 the Abu Dhabi Company for Onshore Oil Operations (ADCO) was established to take over onshore operations. The new company's shareholders were: ADNOC (60 per cent); BP (9.5 per cent); Shell (9.5 per cent); Total (9.5 per cent); Exxon (4.75 per cent); Mobil (4.75 per cent); Partex (2 per cent), these foreign companies being the shareholders of ADPC. Abu Dhabi's main onshore oilfields are the fields at Asab, Bab, Bu Hasa, Sahil and Shah. Other fields are under development at Dabb'iya and Rumaitha.

While ADMA-OPCO and ADCO are the major companies on the Abu Dhabi oil scene (accounting for more than 90 per cent of production), some other companies –besides ADOC – also operate there. The Total Abu al-Bukhoosh Oil Company was formed in 1973 to develop the offshore Abu al-Bukhoosh oilfield, discovered in 1969, which came on stream in June 1974. The original owners of the company were Total (51 per cent), the US's Charter Oil (24.5 per cent), Canada's Sunningdale Oil (12.25 per cent) and Amerada Hess of the US (12.25 per cent). In 1991, Charter Oil sold some of its stake to Total, leaving the latter with a 65.7 per cent stake, and later sold the rest the same way. Sunningdale Oil, meanwhile, sold its shares to Amerada Hess, giving it 25 per cent of the shares, with the remainder owned by Total. In 1996, Amerada Hess sold its shares to Japan Indonesia Petroleum. Production from Abu al-Bukhoosh peaked in 1976 at 81,000 b/d and is currently running between 40,000 b/d and 50,000 b/d.

The Bunduq offshore oilfield was discovered in 1965 in an area that straddles the offshore border between Abu Dhabi and Qatar. The two countries agreed to share equally production from the field, and BP, Total and the United Petroleum Development Company of Japan established the Bunduq Oil Company. Production began in 1975 at 30,000 b/d, but because of reservoir pressure maintenance problems this fell to 10,000 b/d in the late 1970s, and, in October 1979, stopped. In 1981, a secondary recovery programme, costing around US $400 million, was launched to reactivate the field. Production restarted at 4000 b/d at the end of 1983 and is currently at around 15,000–20,000 b/d.

In 1973, Amerada Hess, leading a consortium of foreign companies (Marathon Oil, Canadian Superior, Syracuse Oil, Wingate Enterprises, Bow Valley and Sunningdale), discovered another offshore oilfield, Arzanah. But in 1993, with production having fallen from a peak of 20,000 b/d in 1980 to around 6000 b/d, Amerada Hess relinquished its concession and operations were taken over by ZADCO. Initially, plans to produce oil from two nearby undeveloped fields, Dalma and Hair Dalma, offered the possibility of maintaining the Arzanah field and the production facilities on Arzanah island. However, further studies showed that this would not be commercially viable, particularly because of the need for investment to reduce emissions harmful to the environment, and so in November 1998, after nearly 20 years of production, a decision was taken to decommission the field.

Abu Dhabi's oil is considered light, with gravities in the 34–40 degree API range (Murban 39 degrees, Lower Zakum 40, Umm Shaif 37 and Upper Zakum 37). Murban, a blend from the onshore fields, is its major export crude, exported from the Jebel Dhanna terminal which was built in 1963 and expanded a decade later. Umm Shaif and Zakum crude is exported from the terminal on Das Island. Smaller amounts of oil are exported from Abu al-Bukhoosh, Mubarraz and Zirku Island. The quality of Abu Dhabi crude, the long-term evergreen contracts with the customers and the security of supply have combined to make the UAE a major supplier of crude oil to the Far East. Abu Dhabi is by far the biggest supplier of crude oil to Japan.

Oil Refining in Abu Dhabi

Since 1999, oil refining in Abu Dhabi has been carried out by a wholly-owned subsidiary of ADNOC, the Abu Dhabi Oil Refining Company (TAKREER). This was set up as part of a major restructuring of ADNOC (see below). The emirate's first refinery – at Umm al-Nar – started up

in 1976 with a capacity of 15,000 b/d. This was increased to 60,000 b/d in 1983 and 72,000 b/d in 1988. In 1993 capacity was increased again to 85,000 b/d and currently stands at 90,000 b/d. A chlorine plant was started in 1981 with a capacity of 15,000 tons per annum (t/y).

The Ruwais refinery was commissioned in 1981, with a capacity of 120,000 b/d. Hydrocracking facilities of 27,000 b/d were added in 1985. Because of its remote location, a general utilities plant was also established at Ruwais, to produce 90 MW of electricity and 26,000 cu ms of clean water. In 1995, plans were announced for a US $1.2 billion expansion scheme to increase crude distillation by 135,000 b/d, and install a new vacuum distillation facility, a hydrocracker and a delayed coker. A year later, following a thorough review, ADNOC decided to delay by three to five years the implementation of the project. In June 1996, the export of condensates from Ruwais began at a new berth, following the commissioning of a major gas recycling project targeting the Thamama C and F non-associated gas reservoirs underlying the onshore Bab oilfield. In June 1997, Snamprogetti of Italy was awarded contracts to build two 140,000 b/d condensate distillation trains and related sweetening units at the Ruwais refinery. The two trains were commissioned in 2000 (the first in May, the second in July), thus tripling the refining capacity at Ruwais and eliminating the export of condensate. TAKREER's total refining capacity in the middle of 2000 exceeded 500,000 b/d.

At the same time, the general utility plant at Ruwais was being expanded to produce 500 MW of electricity and 8 mn gallons of water. ADNOC awarded a US $600 million contract to the international electrical engineering conglomerate, the ABB Group, to carry out the project which was being completed in 2000. Expansion of the capacity of the sulphur handling terminal (built in 1992), from 4200 t/y to 6200 t/y, was undertaken in the same year. Molten sulphur is shipped from Das Island and taken to Ruwais for processing. The Abu Dhabi National Tanker Company (ADNATCO) has a vessel dedicated to this route.

The impact on the environment has become an integral design consideration for new projects and plants. The demand for gasoline and gas oil in the UAE was forecast in 2000 to grow by 3.5–4 per cent a year. According to the manager of TAKREER's Process Technology & Studies Department, 'Abd al-Muhsin al-Hammadi, in an address to the eighth Annual Middle East Petroleum & Gas Conference in Abu Dhabi in March 2000, TAKREER's ability:

> *to make unleaded gasoline at Ruwais has been demonstrated and some quantities are manufactured as required. Similarly, sulphur in the gas oil has been voluntarily reduced from both the Ruwais and Umm al-Nar refineries. The decision to produce unleaded gasoline, to phase out leaded gasoline production and reduce the sulphur in gas oil in the long-term has been taken in principle, and the optimum configuration is under evaluation. Facilities are expected to be commissioned in 2004.*

In the shorter term, the company's strategy is to increase the capacity of existing refineries to achieve a high reformate octane level and lower benzene and sulphur content with the minimum investment. Back in 1997, ADNOC had released tender documents for what was called the unleaded gasoline package. This included the installation of a host of units related to the production of unleaded gasoline as well as naphtha, liquid petroleum gas, gas oil treating and sulphur recovery. No contracts have been awarded as yet.

TAKREER is awaiting the results of a feasibility study being carried out by the US's Bechtel before deciding whether to build a Dh 1.47 million (US $400 million) lube base oil refinery

with a capacity of 300,000 t/y. If the project is approved, the refinery, integrated with the existing one at Ruwais, will be scheduled for commissioning in 2004. In 1997, ADNOC announced plans for a lube base oil refinery with output of 250,000 t/y, to come on stream in 2001, but the project has been delayed.

The Structure of Abu Dhabi's Oil Industry

Oil policy for Abu Dhabi is determined by the Supreme Petroleum Council that was set up in June 1988. Its chairman is the Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, Sheikh Khalifa bin Zayed Al Nahyan, and its Secretary-General is Yusif bin Omair Yusif, the Chief Executive Officer of ADNOC. Among the Supreme Petroleum Council's responsibilities is management control of ADNOC. This company in turn owns a range of subsidiaries in the UAE and overseas which specialize in upstream and downstream oil and gas operations, as well as distribution, shipping and all other aspects of the hydrocarbons industry.

Aside from ADCO, ADMA-OPCO and ZADCO, the oil companies mentioned above, ADNOC owns or has a majority shareholding in: ADNOC for Distribution (ADNOC-FOD), Abu Dhabi Drilling Chemicals and Products (ADDCAP), Abu Dhabi Gas Industries Company (GASCO), Abu Dhabi Gas Liquefaction Company (ADGAS), Abu Dhabi National Tanker Company (ADNATCO), Abu Dhabi Petroleum Ports Operating Company (ADPPOC), the Liquefied Gas Shipping Company Ltd (LGSC), the National Drilling Company (NDC), the National Marine Services Company (NMS), Natural Gas Shipping Company (NGSCO), National Petroleum Construction Company Ltd (NPCC), the Ruwais Fertilizers Industries Ltd (FERTIL), the Abu Dhabi Polymers Company Ltd (Borouge), the Abu Dhabi Oil Refining Company (TAKREER) and the Abu Dhabi Gas Company (ATHEER).

In 1999, ADNOC underwent a major reorganization to improve internal efficiency and effectiveness, reflecting the results of an internal study that had looked at all aspects of the company. Operational activities that had been supervised directly by ADNOC were converted into five autonomous business units to enhance accountability. One directorate is responsible for planning, directing and guiding the company's growing petrochemical interests. Another manages the increasingly high-profile gas sector. Other directorates are responsible for exploration and production, marketing and refining, and shared services. In addition, a projects management policy requires that project teams work under the direct supervision of the company or directorate which is responsible for implementing the specific venture. Previously, all project work was carried out by ADNOC's project directorate with little coordination among different areas of the organization. Three other directorates – relating to finance, management support, and human resources and administration – provide the five business line directorates with support services. The heads of all eight directorates report to ADNOC's Chief Executive Officer, Yusif Omair bin Yusif.

Abu Dhabi's Involvement in Overseas Operations

Aside from developing its own oil industry, Abu Dhabi has investments in several overseas ventures through the government-owned International Petroleum Investment Company (IPIC).

In 1997, the value of IPIC's shareholding in the publicly listed OMV of Austria (in which IPIC has a 19.56 per cent stake) and Compania Espanola de Petroleos (Cepsa – IPIC's stake, 9.54 per cent) of Spain was estimated at US $881.9 million. (Cepsa is a company engaged in oil refining and distribution, as well as crude production, in Algeria.) IPIC also has a 30 per cent stake in the Pakistani company, Pak-Arab Refinery Ltd (Parco) and a 48 per cent stake in another Pakistani company, Pak-Arab Fertilizers Ltd (Pafco). Parco owns and operates an 864 km product pipeline from Karachi to Multan in central Pakistan. IPIC and Pakistan signed an agreement late in 1997 to build a 100,000 b/d joint venture refinery in Multan. Pafco owns and operates a fertilizer complex at Multan with a capacity of 850,000 t/y.

In October 1999, IPIC announced that it had reached an agreement with South Korea's Hyundai Group to acquire a 50 per cent controlling interest in the latter's Korean oil refining and marketing subsidiary, Hyundai Oil Refinery Company (HDO), with Hyundai affiliates retaining the other 50 per cent. The 50 per cent acquisition was effected through the purchase by IPIC of new HDO shares to the value of Won 612.7 billion (US $510 million). After its acquisition of Hanwha's Inchon Oil Refining Company, HDO had an effective refining capacity of 665,000 b/d–390,000 b/d at Hyundai's Daesan refinery and 275,000 b/d at the Inchon plant. IPIC, as well as acquiring a controlling interest in HDO, effectively has control of management, appointing four out of seven directors on the board.

The Oil Industry in Dubai and the Other Emirates

Dubai is the next largest oil producer in the UAE after Abu Dhabi; but its output is decreasing. In the mid-1990s, production was running at around 230,000 b/d, but the Crown Prince of Dubai and UAE Defence Minister, Sheikh Muhammad bin Rashid Al Maktoum, said in March 2000 that production had dropped to 170,000 b/d in the previous year. Press reports indicate that Dubai's reserves would be exhausted within 20 years. The major player in Dubai oil is the Dubai Petroleum Company (DPC) which is a wholly-owned subsidiary of Conoco of the US. It is the operator in a consortium comprising itself (32.5 per cent), Totalfina-Elf (27.5 per cent), Repsol of Spain (25 per cent), RWE-DEA of Germany (10 per cent) and Wintershall (5 per cent). DPC discovered the four major offshore oilfields, Fateh, Southwest Fateh, Rashid and Falah between 1966 and 1976. Dubai's oil production peaked in 1991 at 410,000 b/d and has been steadily declining ever since. But production of condensate from the onshore Margham field is running at around 25,000 b/d. Margham, previously operated by Arco International Oil and Gas Company, is now run by the Dubai Margham Establishment, which is wholly owned by the Government of Dubai and chaired by Sheikh Ahmed bin Saeed Al Maktoum.

A condensate refinery began production at Jebel Ali in May 1999. In June 1997, the Dubai government-owned Emirates National Oil Company (ENOC) awarded a US $137 million contract to Technipetrol, the Italian subsidiary of France's Technip, to carry out the first phase of the project with a refining capacity of 60,000 b/d producing mainly jet fuel, diesel and naphtha for local consumption. The plan was that in the second phase, output would be increased to 100,000 b/d, but in January 1998, ENOC awarded Technipetrol a new contract, worth US $46 million, to double production at the refinery from 60,000 b/d to 120,000 b/d. This gives the refinery five Merox units to process condensates from the Gulf region into

34,000 b/d of kerosene, 11,500 b/d of diesel, 5000 b/d of liquefied petroleum gas (LPG) and 33,000 b/d of naphtha. The refinery is owned and operated by ENOC's wholly-owned subsidiary, ENOC Processing Company.

Dubai has three terminals from which oil and LPG is exported: Jebel Ali, Port Rashid and Fateh. On the domestic front, ENOC and Caltex announced in January 1997 that they had set up a joint company to produce and market engine oil and lubricants in the UAE. The new company – Emirates Petroleum Products Company (EPPCO) Lubricants – acquired a lubricating oil plant in Dubai owned by Caltex. ENOC was established at the end of 1993 by the Dubai government with a fully paid up capital of Dh 100 million (US $27 million) to promote joint venture petroleum projects inside and outside Dubai. It has a 60 per cent share in EPPCO, with Caltex holding the remaining 40 per cent. EPPCO markets petroleum products in the northern emirates of the UAE. Early in 2000, ENOC revealed that it, too, intended to move into the domestic petroleum retail market, setting up 30 gasoline stations in Dubai and other emirates. Thus ENOC would not just face competition from EPPCO, but also from ADNOC for Distribution (ADNOC-FOD) and Emarat, the UAE's two other gasoline retailers.

Another wholly-owned subsidiary of ENOC, the Dubai Shipping Company, ordered two small tankers in 1998 from Daewoo of South Korea. The two double-hulled tankers were due for delivery in the first half of 2000. The vessels were ordered to handle imported feedstock for the Jebel Ali condensates refinery.

Dubai's northern neighbour, Sharjah, is the third largest hydrocarbon producer in the UAE, with oil production centred on the offshore Mubarak field. This lies close to an area occupied by Iran, and the northern part of the field lies in an Iranian concession area. As a result, while Sharjah has drilling and production rights, it shares production and revenue with Iran. At the same time, 20 per cent of Sharjah's remaining revenue is shared with the emirate of Umm al-Qaiwain and 10 per cent with Ajman. Sharjah's hydrocarbon resources are confined largely to natural gas (see later in this chapter) and condensates. Crescent Petroleum, through its wholly-owned subsidiary, Buttes Gas & Oil International, brought the Mubarak field on stream in 1974, with output of 60,000 b/d. By the mid-1980s, production had dropped to 5000 b/d. At this stage the acreage was divided in the following way: Crescent (80 per cent), Finland's Neste Oy (12.5 per cent), Bahrain-based Intoil (7.5 per cent). A ten-year field development programme was started in 1986 to bring production up to 20,000 b/d. At the end of that period, Crescent's partners pulled out, and a farm-in agreement was signed with Enterprise Oil of the UK. In May 1998, Crescent announced that it had started exploratory drilling of the Khatir Number One well – with production to be hooked up to the Mubarak field. The work was being carried out under the terms of an agreement between Crescent and Enterprise Oil to boost production from the Mubarak field. The agreement provided for Enterprise to spend around US $25 million on a 3-D seismic survey and the drilling of at least two exploration wells in return for a 40 per cent share of the new wells. Early in 2000, production from the Mubarak field was estimated at 6000 b/d.

Despite the paucity of its oil prospects, the ruler of Sharjah, Sheikh Sultan bin Muhammad Al Qasimi, issued an Amiri decree in October 1999 establishing the Sharjah Petroleum Council. This supersedes the Sharjah Department of Petroleum and Minerals which was set up in 1972. The Council's task, among others, is to draw up the emirate's policy regarding the production and processing of oil, as well as all other matters related to oil.

In mid-1999, a small refinery in the Sharjah free trade zone of al-Hamriyah began operations. It is run by the Sharjah Refining Company (SRC) – an affiliate of the Fal Group of the UAE. The refinery, which cost some US $250 million and was bought second-hand in Canada, was put together in three phases. The first phase consisted of a 16,000 b/d crude distillation unit and a 7500 b/d reformer.

The search for oil in Ra's al-Khaimah has been continuing since 1967, with the emirate estimated to have reserves of 400 million barrels of oil and condensate. Offshore production from the Saleh field has fallen from an initial rate of 11,000–12,000 b/d and is now suspended. In June 1998, the Ra's al-Khaimah Oil and Gas Company said that it had failed to find any hydrocarbons at its offshore exploration well Aman-1 which had been spudded in February that year. The well had been drilled to a depth of 17,580 ft.

Fujairah's involvement in the oil industry is limited to refining – and that operation has not been without its difficulties. But in January 2000 prospects seemed brighter after an announcement by the Department of Industry and Economy in Fujairah that the Bermuda-registered Metro Oil Corporation had reached agreement with its creditors to reopen its refinery in the emirate within three months. Operations there had stopped in March 1998 when Metro Oil's parent company, Athens-based Metro Trading International, filed for bankruptcy. It was declared bankrupt the following month by the First Instance Court of Athens. The Fujairah Department of Industry and Economy said that after reviewing technical and financial studies conducted by the parties concerned in settling the Metro Oil affair, it had decided 'that the reoperation of the Fujairah refinery in the present circumstances is feasible taking into account the relative improvement in oil prices and increase in demand for oil products.' The statement added that a license was being granted 'to operate the refinery under the management of an operator with an international reputation and to form the Fujairah Refinery Co Ltd to undertake the project.'

The new company is expected to expand production at the refinery from 75,000 b/d (its capacity at the time of its closure) to 90,000 b/d and extend its range of products to include jet fuel and kerosene as well as the fuel oil and gasoline which were produced in the past. Before its collapse, Metro Trading was one of the main movers of long-haul fuel to the Singapore market for bunkers. Under the restart-up plans, new jetties will be built at Fujairah port, and dredging will be carried out to a depth of 15 metres to accommodate larger tankers. Texaco Inc and Swiss-based Glencore International were reported to have agreed to supply the necessary crude to operate the refinery at full capacity. The main creditors, which include Credit Lyonnais, Banque Nationale de Paris, Fujairah National Bank and Credit Agricole, along with Texaco and Glencore, will be repaid from revenue earned by the refinery. It was further reported at the time that Vopak (formerly Van Ommeren) was holding talks on operating the Fujairah refinery. Vopak and the Emirates National Oil Company were said to be planning to connect the refinery with their adjacent storage terminal by means of two pipelines (one for crude and the other for products). Fujairah, situated on the eastern coast of the UAE close to the Straits of Hormuz, the gateway to the Gulf, has become a major bunkering centre for the region. The emirate is continuing to expand its oil products storage capabilities. A 20-tank storage farm, built at a cost of US $84 million and run by Vopak, was opened early in 1999: towards the end of the year a contract was awarded for the construction of six more tanks. The tank farm is used to distribute products to regional markets such as Pakistan, India and East Africa.

Fujairah, Ajman and Umm al-Qaiwain remain the only three emirates where no oil deposits have been located, although exploration has been carried out in the all three, all of which remain optimistic that commercial quantities may one day be discovered. In February 2000, the ruler of Ajman, Sheikh Humaid bin Rashid Al Nu'aimi, issued a decree setting up the Ajman Petroleum Department to take over all aspects of the emirate's oil and gas industry, onshore and offshore. The new government body was charged with supervising upstream and downstream activities and advising on policy. The Supreme Chairman of the department is Sheikh Ahmad bin Humaid Al Nu'aimi.

The UAE on the World Oil Stage

Abu Dhabi joined OPEC in the late 1960s; but since the formation of the union in 1971, representation at the organization has been in the name of the UAE, with Abu Dhabi acting as the swing producer, altering its production to conform with OPEC quota changes, thus leaving Dubai, with its much smaller output, unaffected. Within OPEC, the UAE – the sixth largest producer – is regarded as a moderate state, seeking a balance between production and price that will satisfy producers and consumers alike. The UAE's production was limited by OPEC quotas in 1999 to 2 mn b/d (a reduction of 157,000 b/d). This restricted output to approximately the following amounts, which were subject to change from time to time: ADCO 900,000 b/d; ADMA-OPCO 380,000 b/d; ZADCO 450,000 b/d; other Abu Dhabi operators 70,000 b/d; and Dubai 200,000 b/d. Abu Dhabi had around 500,000 b/d spare capacity in the first quarter of 2001.

Gas: The UAE's Fuel for the Future

Oil has underpinned the development of the UAE thus far, but there are growing signs that natural gas will be playing an increasingly big role for the Emirates as a whole throughout the twenty-first century. Not only does the UAE own vast reserves of its own, but it is also taking the initiative in developing the Emirates as a hub from which to supply a network that will benefit the entire Gulf region – and possibly countries further afield at a later stage.

Once again, Abu Dhabi has been blessed with the biggest reserves – as much as 90 per cent of reserves are within the territory or under the waters of that one emirate, although a lot of the gas is sour and relatively expensive to produce. Abu Dhabi can take the credit for being one of the first states in the region to realize the value of gas – most of which was previously flared off in all the oil-producing states. As early as 1977, the Abu Dhabi Gas Liquefaction Company (ADGAS) built an LNG plant on Das Island to process associated gas. Initially the plant had two trains, and a third was added in November 1994. As well as LNG, this plant produces smaller amounts of liquefied petroleum gas (LPG), pentane and sulphur. The plant's nameplate capacity is 5.5 mn tons per year (t/y), but production has frequently been in excess of that figure. Since 1992, gas has been produced from Abu Dhabi's share of the vast Khuff reservoir – one of the largest in the world – under the Abu al-Bukhoosh and Umm Shaif oilfields.

The venture's principal long-term customer is the Tokyo Electric Power Company (Tepco) which signed a 20-year contract beginning in 1977 to buy 4.3 mn t/y of LNG, with an option

of lifting additional quantities of up to 4.9 mn t/y, plus a much smaller quantity of LPG. The contract was extended by another 25 years in 1994. Tepco imports about 30 per cent of its gas supply from ADGAS. In May 1997, ADGAS took delivery of its fourth LNG carrier from Kvaerner-Masa Yards of Finland to carry LNG to Tepco's power plant in Japan. The National Gas Shipping Company (NGSCO) operates the carriers. These replaced four other tankers that had been on long-term charter. As well as the Tepco deal, ADGAS has signed a series of short-term supply contracts with another firm in Japan as well as customers in South Korea, Spain, Italy and Belgium.

ADGAS's other major long-term contract, for the supply of LNG to India, was signed in 1999. Under the deal, ADGAS will provide Enron's Indian affiliate MetGas with 500,000 t/y of gas for a 20-year period beginning in 2001. The deal to supply gas for Enron's Dabhol power plant in Maharashtra state had been due for signature at the end of 1998, but was delayed for scheduling reasons. LNG from Abu Dhabi as well as larger volumes from nearby Oman will be used to meet the fuel requirements of the 2450 MW power station.

The Indian company will need some 2.1 mn t/y of LNG to fuel Dabhol once the power plant's second 1624 MW phase is commissioned in October 2001 and the first 826 MW naphtha-fired stage is converted over to gas. The Dabhol Power Company has been running the plant on a commercial basis since early this year after beginning testing operations at the end of 1998. While ADGAS has signed on to supply some 500,000 t/y of LNG, the sales and purchase agreement with MetGas allows the buyer to exercise more downward flexibility in the initial period of the 20-year contract. This is required as a safeguard against operating difficulties or lower than anticipated running rates once the first phase of the power plant shifts to gas and the second stage is started up. MetGas is providing the shipping capacity necessary to transport the volumes to a 5 mn t/y receiving terminal it plans to build at Dabhol. Because the MetGas deal did not start until 2001, ADGAS had spare capacity for short-term supply contracts in the intervening period.

As for the development of the Khuff gas zones in the Umm Shaif and Abu al-Bukhoosh regions, the original plan was to drill five new wells at Abu al-Bukhoosh, which would be connected to a new gas-processing platform. Gas would then be piped ashore via a 165-kilometre subsea pipeline to a treatment plant at Taweelah after which it would be used for power and industrial projects in Abu Dhabi and Dubai. The two emirates signed an agreement in February 1998 under which Abu Dhabi would supply Dubai with 500,000 cubic feet/day (cfd) of natural gas beginning in 2001. In March 1999, construction firms bidding for the offshore portion of the project were told that it had been cancelled. Instead, ADNOC decided to source the gas needed to supply Dubai from ventures in Abu Dhabi's onshore sector. A second gas supply scheme known as the Onshore Gas Development Phase-2 (OGD-2) project is currently under construction at the Bab field. When it comes on stream in early 2001 it will add an incremental 1 bn cfd of sales gas into the domestic network, although it could take some time before industrial users in Abu Dhabi are able to absorb the additional supply from OGD-2. Analysts reckon that for several years after the project is brought on-line there will be somewhere in the range of 400 mn to 500 mn cfd of spare capacity at Bab's Habshan gas plant. This excess could be used to supply Dubai as well as a planned second-phase expansion at the Taweelah A power and desalination complex. Contractors in 2000 were constructing a new pipeline connection to the Maqta/Taweelah manifold as part of the ongoing OGD-2 project. The

existing power plant at Taweelah is already linked into the domestic network through an overland pipeline spur from Maqta.

At one time ADNOC suggested that it might fast-track OGD-3, a third onshore gas development project, to meet Dubai's long-term needs, but the gas involved is extremely sour, with huge amounts of hydrogen sulphide and carbon dioxide. Moreover the cost of developing these reservoirs has been estimated at over US $2/mn BTU, double the US $1/mn BTU required to for OGD-2. Completion of OGD-2 – developing the Thamama C and D gas reservoirs – was due by the end of 2000. It will provide an additional 1100 mn cfd of raw gas, with 950 mn cfd being sold to meet the needs of the expanding power and desalination sector, industrial users and the condensate splitter at the Ruwais refinery. As part of the onshore development, the Asab Gas Development project – a new grassroots facility to process the natural gas from the Thamama F and G reservoirs in the Asab field – was also due for completion in 2000. This has the capacity to produce and gather 825 mn cfd of gas, produce 100,000 b/d of condensate, and reinject 825 mn cfd of sour gas into the various reservoirs. A pipeline will transport condensate to the Ruwais refinery. With the commissioning of the two condensate splitters at Ruwais, exports of condensate from Thamama C and D (100,000 b/d) were to stop. Instead, the condensate from there and a similar amount from Thamama F and G were to be piped to Ruwais for the production of naphtha. The decision to switch from the export of condensates to naphtha reflects the fact that the latter commands a higher price on international markets.

Another major facility at Ruwais is the natural gas liquids processing plant operated by Abu Dhabi Gas Industries Ltd (GASCO). This produces around 6 mn t/y of propane, butane and pentane. Output was increased after debottlenecking was carried out in 1996.

Gas for Abu Dhabi's Power and Petrochemicals

The Chief Executive Officer of ADNOC, Yusif Omair bin Yusif, speaking towards the end of 1999 outlined the emirate's gas strategy: 'Abu Dhabi's main future gas policy is to develop gas resources to meet growing domestic demand, giving priority to generating water and electricity, supply of gas to new industries, petrochemical projects and any re-injection needs.'

Estimates of the gas supply needed to meet these requirements all point to a sharply rising demand in the coming decade. Abu Dhabi's gas supply in 2001 is projected at approximately 5.7 bn cfd – consisting of 2.46 bn cfd from condensate gas, 1.62 bn cfd from the Khuff offshore production and 1.62 bn cfd from associated gas. However, demand projections show that power generation and industrial consumption will increase from 1.78 bn cfd in 2001 to 2.1 bn cfd in 2005, and that demand for reinjection will grow substantially from 2.57 bn cfd to 4.25 bn cfd during the same period as Abu Dhabi's oilfields continue to mature, while LNG demand will remain constant at around 1.1 bn cfd. These demand estimates leave a shortfall of nearly 1 bn cfd by the year 2005, and the supply deficit is projected to widen ever further to more than 3 bn cfd by 2015.

Much of the focus in the development of gas-based industries in Abu Dhabi is on the development and expansion of power/water desalination plants, with the private sector playing a major role. The UAE as a whole is acknowledged by other Gulf states as the leader in this field of activity.

Three major privatized power/desalination projects are under way in Abu Dhabi. The Abu Dhabi Water and Electricity Authority (ADWEA), in mid-2000, was considering bids for the construction of a US $408 million private power/water plant near Jebel Dhanna, 250 km west of Abu Dhabi city. Commercial operations of the first power units are expected to start before summer of 2003, with the whole plant becoming operational the following year. In the first phase, the plant will generate 1500 MW of electricity and produce 100 mn gallons/day (g/d) of fresh water. Output will later be expanded to 5000 MW and 200 mn g/d, making it the biggest project of its kind in the UAE and enabling ADWEA to extend the power distribution grid to Al Ain.

Two other private power/water projects are under way in Abu Dhabi. In October 1998, CMS Energy Corporation of the US reached agreement with ADWEA on the construction, privatization and operation of the US $740 million Taweelah A-2 project. The consortium, Totalfina-Elf and Tractebel of Belgium, were the successful bidders for Taweelah A-1. When refurbishment of al-Taweelah A-1 is complete, output will be around 1050 MW of electricity and 70 mn g/d of water.

Demand for power and water in Abu Dhabi is increasing by 8 per cent a year, according to the Deputy Director of ADWEA, 'Abd Allah Al Nu'aimi, speaking in the first quarter of 2000. At present the emirate is generating 3500 MW of electricity and producing 262 mn b/d of water. Output is expected to rise to 6964 MW/400 mn b/d by 2005 and 7536 MW/573 mn b/d by 2010. Mr Nu'aimi said the privatization schemes were part of a new drive towards cost reduction.

Abu Dhabi is also taking steps to develop and expand its petrochemicals sector. Construction of a 600,000 t/y ethylene plant in the Ruwais industrial area was under way in mid-2000. The project, which will also contain two 225,000 t/y polyethylene plants, is being carried out by Borouge, a joint venture owned 60 per cent by ADNOC and 40 per cent by Borealis. Borealis is 50 per cent owned by Norway's Statoil and 25 per cent each by Austria's OMV and Abu Dhabi's downstream investment arm, IPIC. The ethane-based cracker will supply feedstock to the two polyethylene plants and ADNOC's planned dichloride plant. Borouge will be producing high-density and linear low-density polyethylene. Borouge Singapore will handle marketing of the products.

While Borouge is a newcomer, the Ruwais Fertilizers Industries Ltd (FERTIL), which is owned by ADNOC (63.75 per cent) and TotalFina Elf (33.25 per cent), began production of ammonia and urea in 1984. By 1994 the output of the two was 600,000 t/y.

Rising Gas Demand in Dubai

In the northern emirates, by far the largest market for gas is Dubai, the trading and commercial hub of the UAE and the Gulf region as a whole. The emirate produces limited amounts of gas itself, and this is not nearly enough to meet the rising demand from its fast-expanding industrial sector. At present, its major source of gas (up to 400 mn cfd) is its northern neighbour, Sharjah. Production from the onshore Saja'a field, situated to the west of the Hajar Mountains, began in 1982 and from Moveyeid in 1992. Later the same year a major gas and condensate discovery was made at Kahaif, to the south. In December 1992, BP Amoco Sharjah Oil Company announced it would be drilling two gas wells to increase natural gas and condensate production. At the time, BP Amoco was producing more than 650 mn

cfd from Saja'a, Moveyeid and Kahaif. Condensate from the three fields was almost 30,000 b/d. The major customers for BP Amoco Sharjah gas are the Sharjah Electricity and Water Authority, the Dubai Supply Authority and the UAE Ministry of Electricity and Water. In September 1999 another operator, Sharjah-based Crescent Petroleum and its partner Atlantis Holding Norway AS, announced that significant quantities of hydrocarbons had been discovered at the offshore Sharjah-2 well. This was the first well drilled by Crescent/Atlantis in the 1018 sq. km block, which runs from the Sharjah coastline to the Crescent-operated Protocol Area where the Mubarak field is located.

Other customers for gas, apart from the Dubai Supply Authority, are the Dubai Electricity and Water Authority, several petrochemical and fertilizer plants located at Jebel Ali – as well as the Dubai Aluminium Company (Dubal), which in March 2000 inaugurated its US $736 million Condor expansion project, making Dubal the second largest smelter in the world and the largest in the Middle East. The plant can generate 440 MW of electricity and produce 148,000 t/y more aluminium with a negligible increase in natural gas consumption.

All these projects are swiftly pushing up the demand for gas in Dubai. In 1998, power generation and water desalination consumed around 380 mn cfd, with peak demand rising to 500 mn cfd. Government forecasts project demand growth rates for these two sectors at between 8 per cent and 9 per cent annually through to the year 2010. Dubal in 2000 was consuming an estimated 240 mn cfd. Other industries in Dubai (existing or under construction) used 70 mn cfd in 1998 and this figure is set to rise to 90 mn cfd by 2005.

Abu Dhabi agreed in February 1998 to supply 500 mn cfd of gas to Dubai. Abu Dhabi first considered supplying this gas from its offshore Khuff project. But, as described earlier, it decided to source the gas initially from its OGD-2 development. In February 2000, work began on constructing a 112 km pipe from the al-Taweelah processing plant in Abu Dhabi's Maqta' district to the Jebel Ali industrial zone in Dubai. But the plan is that, at a later stage, gas from Qatar will reach Dubai via this pipeline.

The idea of the Qatar connection arose out of a realization on the part of the UAE leadership in 1999 that the scope of the demand for natural gas in the Emirates and elsewhere in the Gulf was rising so rapidly that new and much broader strategic thinking was required. This led to the birth of the most ambitious gas distribution scheme ever attempted in the Middle East: the Dolphin initiative.

The Dolphin Initiative – Qatar's Gas For UAE and Oman

The United Arab Emirates Offsets Group (UOG) is the body that handles the investments which foreign companies making military sales are required to place in the Emirates. Early in 1999, UOG came up with the idea of bringing gas to the UAE market – and to Dubai in particular. The logic is obvious. Qatar, in its offshore North field, has one of the biggest reservoirs of gas in the world. It needs to find a market, and Dubai needs to find a new source of supply. So the UOG suggested the building of an 800 km undersea pipeline from the North field to a landfall in Abu Dhabi. From there the gas would be piped overland, first to Jebel Ali and then on to Oman, and at some much later date, the pipeline might be extended to the Indian subcontinent. The scheme was named the Dolphin initiative.

Throughout 1999 and in the early months of 2000, UOG began putting together a chain of preliminary agreements to prepare for the launch of Dolphin. In June 1999, UOG signed a Memorandum of Understanding (MOU) with the Dubai Supply Authority for the delivery of 200–700 mn cfd of gas from the Dolphin project. Furthermore, under a joint declaration by ADNOC and Dolphin in November the same year, the latter agreed to supply the 500 mn cfd which Abu Dhabi had agreed (in February 1998) to supply to Dubai – depending on the latter's approval. By the first quarter of 2000, Dolphin still had not finalized with Dubai exclusivity over gas sales to the emirate, the volume requested and the price.

In June 1999, UOG signed two more MOUs with potential customers for Dolphin gas. The first was with Oman for the supply of 300–600 mn cfd on a long-term basis. The second was with Pakistan for the supply of up to 1.5 bn cfd. Then in July UOG and Mobil Oil Qatar signed an MOU to start negotiations on developing a long-term supply and purchase agreement for initial gas supplies from the North field of 300–500 mn cfd. In the short term the Qatari government has indicated that the gas will be supplied by existing concession holders. At a later stage UOG will be granted the right to develop gas reserves in the North field.

Then in March 2000 came an announcement from UOG that they had reached an agreement with the US's Enron and France's Elf (a subsidiary of Totalfina) on a strategic partnership to implement the Dolphin initiative. The formation of the partnership represented a major step forward for Dolphin and set the stage for detailed negotiations with potential customers for the proposed gas network. UOG will hold a 51 per cent majority shareholding in the new partnership, with the remainder split equally between Enron and Elf. (The Elf name has been retained for the merged company's Middle Eastern operations for legal reasons, and is expected to remain in use for some time.) The Project Development Agreement (PDA) foresees the partnership lasting a minimum of 25 years, and its initial goal will be to develop the resource-base part of the project. Elf's contribution will be to ensure that the upstream part of Dolphin is completed as cost-effectively as possible, while Enron will oversee the midstream, particularly pipeline construction and operation, as well as raising and managing capital for the venture.

President and CEO of Enron, Jo Sutton, said that the venture partners would focus in the near term on the construction of a pipeline from Qatar to Dubai via Abu Dhabi. He predicted that within 12–18 months the group would begin construction of the first phase, with a view to completion in late 2002 or early 2003. Initial deliveries to Abu Dhabi are expected to reach around 1.2 bn cfd of gas, expanding to 3 bn cfd over 2–3 years as the customer base grows. Of this amount, 80 per cent is earmarked for use in the UAE, and this will include the 500 mn cfd which Abu Dhabi has contracted to supply to Dubai. A decision on extending the supply line to Oman 'will depend on whether we want to supply more gas within the UAE or to sell to Oman.'

The cost of the production facilities and the pipeline from Qatar to Abu Dhabi, Dubai and Oman is predicted to total about US $4 billion, of which US $2–3 billion is expected to be spent on production and processing and US $1–2 billion on the pipeline. The overall capital cost of taking gas to these markets and building the power projects and industrial plants linked to the gas stream is projected to be US $8–10 billion, much of which is to come from the customers. Besides potential power schemes, UOG is hoping to line up energy supply contracts to LPG, petrochemical, fertilizer, ammonia and other industrial producers in the region. According to the former Chairman of UOG, Dr Amin Badr el-Din, 'lots of this gas demand is driven by the need for power generation

in the region; also, many industrial developments are being held up by a lack of gas in the UAE and Qatar. It is the same in Dubai, too, where a number of projects are waiting to be sanctioned.'

With its decision to launch the Dolphin project, the UAE is taking the initiative in developing the first links in an intra-Gulf gas network, a concept that has been much discussed. Beyond that, the UAE could become the hub for an even wider gas distribution system, with pipelines extending to Pakistan at first, and possibly as far as India at a later stage. While sceptics cast doubt on the possibility of a gas pipe being laid on the sea bed deep under the Indian Ocean, UAE officials say they are determined to see if a way of overcoming current obstacles can be found.

UAE Oil and Gas – an Environmentally Sound Future

Having established itself as one of the major players in the international oil and gas industry and an innovator in intra-Gulf cooperation, the UAE is setting its sights on responsible, secure and environmentally safe development in the century ahead. Despite the fact that the role of gas is increasing fast, the UAE does not believe that the oil era is over or that its demise is imminent. Nevertheless, leading figures in the UAE's oil industry believe that further study is needed to see how the continued expanded use of oil as a power source could be made to be compatible with the growing awareness and concern around the world about preserving the environment. This point was made by the Chairman of ADNOC, Yusif bin Umair Yusif, in a speech opening the eighth Middle East Oil & Gas Conference in Abu Dhabi in March 2000. Some commentators, he said, defined the Kyoto Protocol to reduce the emission of greenhouse gases as the beginning of the post-oil age. Research was being carried out into developing alternative automative fuels. 'But our concern,' the ADNOC Chairman said, 'is that resources should be effectively targeted and the full cost should be taken into account, both financially and to the environment.' Electricity, for example, still has to be generated from primary energy sources; and there is transmission loss in moving it and difficulty in storing it. 'In the Middle East,' Mr Yusif went on:

> *we are sitting on top of two thirds of the world's proven oil reserves and they are relatively low cost to develop. The gasoline and diesel fuels which are refined from these crude oils are reliable, cheap and efficient, with a long successful track record. It would be beneficial for us and the world if more research into the production of these hydrocarbon-based transportation fuels is undertaken, which will make them even more environmentally friendly and will maintain and enhance their attraction for many more decades. We believe these conventional transportation fuels will remain more economically viable than the alternatives and merit more intensive research than they are currently receiving.*

The UAE which, from the earliest days of oil discoveries, has demonstrated its realization of the need for constant technological improvements in the oil industry to keep pace with the world at large and the necessity to strive for an increasingly efficient and safe industry, is ideally suited to act as a catalyst for the research needed to adapt oil products to the stringent environmental regulations of the twenty-first century. Given the UAE's determination to keep its place among those nations that are quick to realize the need of oil producers to adapt to changing circumstances and consumer demands, it can look forward to many more decades in which its oil and gas industries will provide a secure and dynamic base for economic growth.

UAE Oil and Gas Statistics

Table 1. Crude oil production 1978–1999 (thousand b/d)	
1978	1,830.5
1979	1,830.7
1980	1,701.9
1981	1,502.3
1982	1,248.8
1983	1,149.0
1984	1,069.0
1985	1,012.6*
1986	1,146.0*r
1987	1,281.1*r
1988	1,359.4*r
1989	1,641.3*
1990	1,818.5*r
1991	2,093.6*r
1992	2,241.1*r
1993	2,159.3
1994	2,166.5
1995	2,148.0
1996	2,161.3
1997	2,160.7
1998	2,255.3
1999	2,071.0

*– provisional or estimated figure. r – revised. Source: OPEC

Table 2. Crude oil exports by destination 1994–1998 (thousand b/d)					
Destination	**1994**	**1995**	**1996**	**1997**	**1998**
North America	**23.6**	**–**	**1.4**	**–**	**2.5**
Latin America	**10.0**	**–**	**–**	**–**	**7.5**
Eastern Europe	**–**	**–**	**–**	**–**	**–**
Western Europe	**61.7**	**2.0**	**0.7**	**2.0**	**13.0**
France	1.4	–	0.1	–	11.2
Germany	0.6	–	–	1.0	–
Italy	–	–	–	–	–
Netherlands	–	–	–	1.0	–
UK	–	–	–	–	1.3
Africa	**30.0**	**36.0**	**40.9**	**40.0**	**57.0**
Asia and Far East	**1,751.6**	**1,828.9**	**1,843.6**	**1,846.9**	**1,924.1**
Japan	1,212.9	1,215.0	1,195.1	1,213.4	1,205.0
Oceania	**78.1**	**58.1**	**56.6**	**60.1**	**34.9**
OECD	**1,376.3**	**1,273.0**	**1,253.8**	**1,275.5**	**1,255.4**
Total World	**1,955.0**	**1,925.0**	**1,943.2**	**1,949.0**	**2,039.0**

Source: OPEC

Table 3. Main oil-producing fields in the UAE

Field	Discovered	Producing Wells	API Gravity
Abu Dhabi:			
Abu al-Bukhoosh	1969	42	32.0
Asab	1965	106	41.0
Bab	1958	100	44.0
Bu Hasa	1962	201	39.0
Bunduq	1964	23	40.0
Mubarraz	1969	28	37.0
Sahil	1967	22	39.7
Satah	1975	10	39.8
Umm al-Dalkh	1969	32	32.5
Umm Shaif	1958	142	37.0
Lower Zakum	1963	131	39.0
Upper Zakum	1963	142	35.0
Total		**979**	
Dubai:			
Falah	1972	25.5	
Fateh	1966		31.8
Rashid	1973	141	38.0
Margham	1981	10	43.5
Total		**151**	
Ra's al-Khaimah:			
Saleh	1983	**7**	50.0
Sharjah:			
Kahaif	1992	4	50.0
Saja'a/Moyeid	1980	30	50.0
Mubarak	1972	14	47.0
Total		**48**	

Source: IPE, *MEES*

Table 4. Natural gas production 1994–1998 (million cubic metres)

	1994	1995	1996	1997	1998	98/97 % change
Gross Production	**34,360**	**40,860**	**45,930**	**48,090**	**48,980**	**1.9**
Marketed Production	25,820	31,320	33,800	36,310	37,070	2.1
Flaring	390	360	390	1,520	1,500	–1.3
Reinjection	4,330	6,000	8,510	7,000	7,150	2.1
Shrinkage	3,820	3,180	3,230	3,260	3,260	–

Source: OPEC

Economic Development in the UAE

Mohamed Shihab

Introduction

Thirty years ago the UAE was one of the least developed countries of the world. Today, it has achieved an income level comparable to that of the industrialized nations. The UAE did not pass through the hypothetical development '*stages*' that most developed countries seem to have experienced. Rather, its large oil revenues have allowed her to leap these stages to the stage of high mass consumption. Massive oil revenues have enabled the UAE to short-cut the usually difficult and lengthy process of saving and capital accumulation necessary for economic development. Given an abundance of natural resource endowments (oil and gas), the UAE has embraced resource-based industries (RBI) as a development strategy, an industrial strategy that is based on utilization of natural resources. There has been a deployment of windfall income, largely directed at a '*once-and-for-all*' boost to the social and economic infrastructure, which enabled the UAE to achieve a significant degree of economic development within the very brief timeframe of 1973 to 1982, a period of relatively high oil prices.

This chapter takes account of the fact that development economics cannot be separated from the institutional, social, cultural, economic and political context. It also takes into account the all-important human factor, both as a goal and a source of economic development.

Economic and Institutional Constraints

Before the discovery and export of oil, the economy of the Trucial States (which today form the UAE) depended mainly on subsistence agriculture, nomadic animal husbandry, the extracting of pearls and the trade in pearls, fishing, and seafaring. The period before the discovery of oil, therefore, reflected the country's limited natural resources, and resulted in a simple subsistence economy.

The epoch of economic development in the UAE (or the UAE's First Development Decade) began in the early 1970s, the federation's formation on 2 December 1971 (and the establishment of its formal economic, social, and political institutions) coinciding with a massive increase in oil production and oil exports, followed by the explosive rise in oil prices in 1973.

Political and Social Stability

Since its formation in 1971 the UAE has enjoyed a political stability. The existing political structures appear to suit the tribal society of the UAE, and the distribution of huge oil revenues in the form of social and economic infrastructure, high salaries, a high standard of social services, such as health and education, has raised the standard of living for UAE citizens and considerably reduced the likelihood of internal political and social unrest. It is worth mentioning that the UAE Government has maintained a relatively good record on human rights since the formation of the state. This in turn has promoted political and social stability.

The UAE is an active member of many regional and international associations such as the Arab League, the United Nations, the Non-Aligned Movement, the Arab Gulf Cooperation Council, and the Organization of the Islamic Conference. Relations with many countries of the world, particularly the Western democratic countries, have been traditionally warm.

Political and social stability has gone hand in hand with liberal trade policies and has paved the way for investment (domestic and international) in the industrial sector.

Oil and Mineral Resources

The UAE is endowed with vast reserves of oil, both offshore and onshore. Associated gas from crude oil production and non-associated gas is also produced. Since the early 1970s the UAE's phenomenal growth has depended largely on the discovery and exploitation of oil. The oil and gas industries are well managed and the latest technology is continuously harnessed to increase productive efficiency.

According to the UAE Ministry of Petroleum and Mineral Resources, the UAE maximum sustainable daily capacity of oil production (maximum production rate that can be sustained daily for one year in present conditions of exploitation) is 2 million barrels a day. Its installed production capacity is over 3 million barrels per day. In 2000, proven oil reserves in the UAE were 98.8 billion barrels, the third largest oil reserves in the world after Saudi Arabia, and Iraq. The UAE's proven oil reserves were estimated to be almost 10 per cent of the proven world oil reserves in June 2000. On the basis of current daily oil production of 2 .2 million barrels per day, it is estimated that oil reserves in the UAE will last for more than 122 years.

Proven gas reserves were estimated to be 6 trillion cubic metres in 2000. The UAE was estimated to have natural gas reserves equivalent to over 4 per cent of the known world gas. The UAE holds the fourth largest reserves of natural gas in the world. Daily gas production was estimated in 1999 to be 2940 million cubic feet. Gas reserves are estimated to last for more than 60 years. The UAE possesses, therefore, huge reserves of oil and gas, capable of sustaining long-term economic growth.

Other mineral resources in the UAE are divided into three categories: rocks, sands and soils, and metals. The exploitation of minerals is primarily restricted to rocks and sands. Rocks and gravel are used for construction. Limestone, sand, marl and gypsum are used to manufacture cement. There is also small-scale mining of the mineral chromite in Fujairah.

Agricultural Resources

The total area of land under agriculture and forestry constitutes less than 1.5 per cent of the total land area of the UAE. Agriculture has made only a small contribution to GDP (3.8 per cent in 1999). There has, however, been a consistent and substantial increase in the amount of land devoted to agriculture and forestry over the past 30 years as the result of sustained efforts by the UAE Government to promote agricultural development using the following incentives:

- Agricultural plots are granted free to any UAE citizen.
- Land is levelled and prepared mechanically for free.
- Production inputs such as seeds, fertilizers, and insecticides are provided at half cost.
- Water wells are drilled for free.
- There is provision of free technical services such as installation of water pumps.
- An agricultural credit line was established in 1978 to grant farmers loans for water pumps, fence wires, fishing boat engines, green houses, and drip irrigation systems. This agricultural credit attracts no interest.
- A market for produce is secured by government intervention. Small farmers are protected from foreign competition by a policy of buying the farmers' products at favourable prices.

The very limited agricultural potential of the UAE, with unsuitable land, water scarcity and harsh climate, has not been an obstacle to its economic development. Clark (1984) argues that although improvement in agricultural productivity is normally a necessary condition for successful development, there are exceptions when a developing country (particularly richly endowed with minerals) produces what he terms '*food substitutes*' – mineral or forest products, which can be exported to world markets, purchasing food imports which then partially substitute for the productivity of the country's own agriculture.

Population and Labour Force

The UAE population is essentially a small one. However, after the discovery of oil and its export in the last four decades, it has experienced very rapid growth, the result of a combination of high natural rates of increase among the UAE's indigenous population, and a massive inward migration of expatriates who now comprise more than three quarters of the population. Thus, a small indigenous population, a large expatriate population, and immense wealth generated by oil are the dominant socio-economic features of the UAE.

In addition to population size and age composition, social factors in the UAE have a great impact in determining the size of the UAE labour force. Female participation in the UAE labour force remains small, 16.3 per cent in 1999. However, incentives and legislation aim to change this situation. Greater female participation is seen as a way of increasing the UAE indigenous labour force and lessening the country's dependence on foreign labour.

A two-tier labour market has emerged in the UAE. At the top is the indigenous labour force, which constitutes about 10 per cent of the total work force. Below this is an unlimited supply of foreign labour. The UAE has reaped benefits from foreign skilled and unskilled workers, who initiated its economic development in the early 1970s and subsequently have come to sustain it.

The employment pattern in the UAE does not reflect the structure of output. The oil sector employs only 1.6 per cent of the UAE labour force, reflecting the capital-intensive nature of the industry. Nearly 39 per cent of the labour force is engaged in community, social and personal services. The unemployment rate in the UAE (0.5 per cent) is remarkably low, which means that the UAE economy is effectively at full employment.

The UAE is highly urbanized. This has been attributed to the cluster of public services, transportation and communications, financial markets and service-based industries in the cities.

Table 1. UAE's main economic indicators 1990–1999

Economic indicators	1990	1991	1992	1993	1994	1995	1999
GDP at current prices (Dh billion)	125.3	126.0	128.4	131.7	135.0	143.9	181.5
Real GDP growth (%)	11.9	–2.4	–0.9	–0.6	–2.4	–0.8	6.7
Population (million)	1.84	1.91	2.01	2.09	2.23	2.37	2.93
Total exports (fob), $ billion	21.25	22.15	23.37	23.31	21.78	23.44	32.28
Imports (fob) $ billion	11.69	13.92	15.83	17.75	18.25	18.98	28.33
Current account ($ billion)	5.09	1.53	3.00	0.18	–0.72	0.36	3.94
Reserves excluding gold ($ billion)	4.58	5.37	5.71	6.10	..	..	..
Total external debt ($ billion)	11.05	10.20	10.80	11.07	..	..	..
Oil production mnb/d	2.12	2.42	2.29	2.22	2.17	2.22	2.28
Oil price (average) $/barrel	..	..	18.5	16.4	14.3	15.5	18.2
Crude oil exports ($ billion)	..	..	14.10	12.10	10.28	11.44	16.62
Exchange rate Dh:US $ (average)	3.671	3.671	3.671	3.671	3.671	3.671	3.671
Inflation (%)	..	..	5.5	3.2	5.0	5.5	3.1

Sources: MoP (Ministry of Planning, UAE), *Annual Economic Report 1999.*
CPC (Crown Prince Court, UAE), *Development Indicators in the UAE* (1999).

Structural Changes in the UAE's Economy

Economic development can be perceived as change in the structure of the economy. Structural change refers to terms such as agricultural transformation, industrialization, demographic transition, urbanization, transformation of domestic demand and production, foreign trade, finance, and employment.

In considering structural changes in the UAE's economy, this chapter intends to identify and describe the pattern of the UAE's economic growth and to determine its achieved level of development. In taking this structural view of the economy, the chapter examines the distinct sectors of economic activity and how these sectors respond to changes in demand to which the development process subjects them. This partition of the economy into sectors permits greater understanding of the problems of development.

One clear pattern of the changing economic structure in the course of economic development is that the share of industry increases as gross output per capita rises. Following the Second World War, rapid industrialization was viewed as a prerequisite for modernization and structural change. The difference in the output and the contribution to GDP of the industrial sector in developing countries as opposed to its place in developed countries was seen as the main manifestation of economic backwardness and dependence.

While value added growth rate in the UAE oil sector was fluctuating during the period 1975–1998, the manufacturing sector value added growth rate was steadily increasing. The manufacturing value added increased considerably from Dh 472 million in 1975 to Dh 9443 million in 1985, and to Dh 18,855 million in 1998 (at constant prices). Its contribution to GDP increased significantly from 0.9 per cent in 1975 to 3.8 per cent in 1980, and to 12.4 per cent in 1998. Nonetheless, it is obvious that the substantial increase in the manufacturing value added has made a modest contribution to the UAE's total output growth.

Agricultural production increased more than fourfold from 1975 to 1998 at an average annual growth rate of 12.6 per cent. This consistent increase in the agricultural output is attributed to the sustained efforts of the UAE's Government to promote agricultural development with generous agricultural incentives and subsidies. Changes in the contribution to GDP of the non-oil sector (agriculture), however, increased at a moderate rate. In 1998, the agricultural sector comprised about 3.6 per cent of GDP.

A conspicuous sectoral shift and contribution to GDP is evident in the service sector, commerce (wholesale and retail trade), restaurants, hotels, transport, storage, communications, finance, insurance, real estates and government services. The service sector contribution to GDP increased from 22.3 per cent in 1975 to 39.7 per cent in 1998.

Table 2. Relative importance of UAE's main economic sectors 1975–1998

(percentage of GDP)

Sector	1975	1980	1985	1995	1998
Agriculture	0.7	0.9	1.5	2.0	3.6
Crude oil	67.7	56.4	44.0	41.1	22.4
Manufacturing	0.9	6.9	9.2	8.7	12.4
Electricity and Water	0.5	1.3	2.2	2.1	1.8
Construction	9.0	8.3	8.8	8.4	9.4
Commerce, restaurants and hotels	9.3	9.0	8.8	10.1	13.7
Transport, storage and communications	3.0	3.4	3.8	5.5	7.0
Financing & insurance	1.6	3.5	5.1	4.3	6.7
Real estate	2.5	3.8	4.9	6.2	10.5
Government services	4.8	7.0	10.5	10.9	11.8

Sources: MoP (Ministry of Planning, UAE), *Economic and Social Indicators in the UAE, 1975–1985*, (1987).
MoP (Ministry of Planning, UAE), *Economic and Social Indicators in the UAE, 1985–1990*, (1993).
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Structural Change in the UAE's Employment Patterns

The service sector, which includes trade, restaurants, hotels, transport, storage, communications, finance, insurance, real estate, business services, community, social and personal services, ranks first in size of employment (58 per cent of the labour force), which reflects its powerful dominance in the UAE. The share of employment in the service sector increased from 51.91 per cent in 1975, to 56.97 per cent in 1980, and to 57.9 per cent in 1998, corresponding to the increase in the sector's real output over the same period 1975–1998.

The service sector value added comprised the second largest value added (after the oil sector) in the UAE's GDP in 1998.

The agricultural sector employed 7.4 per cent of the UAE labour force in 1998, the fourth ranking sector in labour force distribution. Its employment share increased from 4.55 per cent in 1975 to 7.4 per cent in 1998, corresponding to a steady increase of real output over the same period.

Although the manufacturing sector accounts for a low proportion of employment (12.6 per cent of the labour force), its share of employment increased from 5.83 per cent in 1975 to 7.41 per cent in 1985, and to 12.6 per cent in 1998, matching an increase in real output over the same period.

In employing 1.6 per cent of the labour force, quarrying, petroleum extraction and mining sector was ranked last in share of employment, despite its paramount importance in the UAE economy, reflecting the fact that the oil sector is highly capital-intensive.

Industrialization

In the process of economic development, industrialization has been considered crucial to the transition. Industrialization is linked to the idea of stimulating forward and backward linkages with the rest of the economy. In addition, industrialization creates new employment opportunities. In common with other developing countries, the UAE, whose economy has been significantly dependent on the export of one primary product, namely oil, pursued a strategy of industrialization to diversify the sources of its national income and reduce its dependence on oil.

The main factors which have acted as a constraint on UAE industrial development are limited raw materials, and the size of the domestic market. On the other hand, the abundance of natural mineral resources, the ready availability of financial capital, a well-established infrastructure, a flexible labour and employment policy, the availability of cheap energy, industrial zones and various incentives in legislation, plus political and social stability have been the main resource and incentive for UAE industrialization.

From the UAE Industrial Survey of 1988, 1992 and (MoFI 1988, 1992, 1996), the pattern of industrial establishments can be summarized as follows:

- The first industrial establishment in the UAE, in the emirate of Dubai, was a small workshop for steel boxes and containers, established in 1950.
- The period from 1951 to 1958 did not witness the establishment of any industrial firm.
- The increase in industrial establishments began in 1959, the period coinciding with the discovery of oil in the emirate of Abu Dhabi.
- 1977 was a golden year in UAE industrial development, in which 84 new industrial establishments were recorded, the highest number of industrial establishments in a single year during the period 1950–1992.
- The number of industrial establishments grew at an increasing rate during the period 1959–1977.
- From 1978 to1995, however, the number of industrial establishments grew at a decreasing rate.

To some extent industrialization in the UAE has broadened the base of the economy, as shown by increased industrial productivity; a diversification of exports to more than 184 industrial products, and an increase in the value of industrial exports from Dh 11 million in 1975 to Dh 539 million in 1980, Dh 4825 million in 1985, and to Dh 8070 million in 1990 (in constant prices). Nevertheless, industrialization in the UAE has not reduced significantly the economy's reliance on oil (Shihab 1990).

Human Development Indicators

The main human development indicators in the UAE can be analysed at two levels: a) nationally over time and b) internationally (or cross-sectionally), comparing performance with both developing and industrial countries. The first level, nationally over time, enables us to explore the rate, structure, and character of human development in the UAE. The latter, internationally, enables us to examine the degree of human development in the UAE compared to both developing and developed countries.

At the national level, the UAE has achieved impressive improvements in many human development indicators during the past three decades. At the international level, the UAE has recorded high levels of development bearing comparison with the average of the developing countries, and even with some individual industrial countries.

Educational Institutions

A positive relationship between education and economic growth is well-established. Education and training are viewed as major determinants of increasing productivity, and as a factor diffusing growth. Education is considered a key element in developing the necessary skill levels for growth and modernization in the UAE. The UAE Government offers free education to all UAE citizens, and Arabic-speaking children of expatriates employed in the public sector.

Educational institutions in the UAE consist of public and private sector schools, military schools, higher education and vocational training establishments. The existing educational structure was established in the early 1970s and consists of a four-tier system covering 14 years of education, as follows: kindergarten (4–5 years old); primary (6–11 years); intermediate (12–14 years) and secondary (15–17 years). For higher education (i.e. undergraduate, Master and Ph.D. programmes) UAE citizens are entitled to choose between study in the Emirates University or abroad through a generous scholarship system. Primary school education is compulsory for all UAE citizens. Government policy is to provide staff/student ratios of 1:20 at kindergarten and primary levels and 1:15 at intermediate and secondary levels. The existing staff/student ratios are well within this proposed range. (The staff/student ratio of kindergarten and primary levels is 1:17; intermediate and secondary levels is 1:10).

The Higher Colleges of Technology, located in several emirates, were established in 1988 and are aimed at offering courses of three years' technical training in skills such as business administration, accounting, banking, information systems, computers, engineering, aviation technology, and health sciences.

Encouraged by financial incentives, government civil servants are required to attend yearly at least one seminar (at local or international level) within their respective fields as a condition for future promotion.

In his influential article, Schultz (1961) stressed the role of education in development. He maintained that education could be considered as a process of accumulating capital, which could increase a worker's productivity and income. He referred to this investment in education as an investment in '*human capital*'. Human capital is defined as a productive investment embodied in human resources. Improved skills and health result from expenditures on education, training programmes, and medical care. As indicated by Chatterji (1994), the skill level of the workforce in any economy is a factor that has an important bearing on economic performance.

Carnoy (1967) concluded that education and income are highly correlated at both individual and social levels. People intuitively recognize this fact and consequently try to become as educated as possible. The more schooling and certificates people can accumulate, the better will be their chances of obtaining secure and better-paid jobs. This desire for well-paid jobs has created demand for education as a mean of economic improvement.

On the supply side, a country's political institutions determine:

- The quantity of schools and classrooms at the primary, secondary, and university levels.
- Who is admitted to these schools.
- The kind of education and instructions (values, attitudes, ideas, and aspirations) students acquire.

Current concern, however, centres upon how to improve the quality of education (teaching, facilities and curricula) and how to provide basic education to the vast majority of the population. Behrman and Birdsall (1983) indicate that it is the quality of education and not its quantity alone (years of schooling) that best explains differential earnings and productivity.

Health Services

Many developing countries struggle against malnutrition and poor health. Expenditure on health has been regarded as investment in human capital (Mushkin 1962). Anand and Ravallion (1993) conclude that the quantitative effect of public expenditure on health appears to be sizeable.

The relationship between health and economic development is reciprocal. Economic development policies tend to improve the health status of the population. Better health contributes to economic development. Better health is an important goal in its own right, and is a basic human need. Health increases human potential and improves the quality of human resources. Health programmes, therefore, aim to cut morbidity and mortality, and to provide adequate nutrition, health care and sanitation.

The UNDP's 1995 report estimated that 99 per cent of the overall population of the UAE had access to health services (the percentage of the population that can reach appropriate local health services on foot or by the local means of transport in no more than one hour), 95 per cent of the population had access to safe water, and 77 per cent of the population had access to sanitation (for the period 1985–1993).

The UAE Government's health policies aim at providing a range of facilities and at implementing programmes aimed at advancing the level of service and health education throughout the UAE. There are also preventative medical programmes such as 'mother and child health care', vaccination and inoculations for children, monitoring and notification of infectious diseases, and health educational programmes.

In addition, the UAE Ministry of Health (MoH) provides special medical centres for school children, and health units in every school throughout the UAE. These health units are provided with qualified nurses as well as first aid equipment. Hospitals, beds, doctors and nurses are located throughout the UAE, mainly in accordance with the distribution of the population. Health facilities are, in general, evenly distributed.

There are also a large number of private health facilities. The private health sector makes a significant contribution to the provision of health facilities in all parts of the UAE. Its main contribution consists in the supply of materials, drugs and equipment to the Ministry of Health and private retail outlets. In addition there is a large number of private clinics, medical complexes, hospitals and pharmacies. The main noticeable growth in private sector health services has been in the number of general clinics. As is shown in Table 3, the number of private clinics not only has exceeded the number of public clinics, but has increased from 50 in 1975 to 174 in 1980, to 456 in 1985, to 675 in 1990, and to 896 in 1997.

The number of hospitals (public and private) increased from 19 hospitals in 1975 to 42 hospitals in 1990 and to 57 hospitals in 1997. This increase has been associated with increases in the number of hospital beds. In 1975, for example, there were 1745 hospital beds; by 1997 hospital bed numbers had risen to more than 6334 beds.

Numbers of doctors (general physicians) increased from 751 in 1975 to 2766 in 1997. Dentists increased from 65 in 1975 to 220 in 1997. The number of nurses rose from 1555 in 1975 to 7695 in 1997. According to the *Human Development Report 1995*, there was a doctor per 1042 persons and a nurse per 568 persons (1988–1991).

Table 3. Health services in the UAE (1975–1997)

Indicators	1975	1980	1985	1990	1995	1997
Hospitals	19	27	40	42	51	57
Beds (hospital)	1745	3872	5817	6297	6365	6634
General physicians	751	1484	1301	1493	2362	2766
Dentists	65	141	173	185	238	220
Nurses	1555	4346	6327	7130	7547	7695
Pharmacists (public)	60	117	190	237	302	325
Public clinics	38	69	107	118	126	125
Private clinics	50	174	456	675	798	896
Population/bed	320	269	237	288	374	604
Population/doctor	743	702	1247	1236	1212	1238
Population/nurse	359	240	339	438	313	454

Sources: MoH (Ministry of Health, UAE), *Statistical Yearbook (1997*).
MoP (Ministry of Planning, UAE), *Economic and Social Indicators in the UAE, 1990–1995* (1998).
UNDP (United Nations Development Program), *Human Development Report 1999* (1999).

In short, advanced health care has done much to lower mortality levels in the UAE and as a result mortality rates have declined substantially. The crude death rate, deaths per thousand of the population, decreased from 7.3 per 1000 in 1975 to 4 per 1000 in 1992, and to 2.1 per 1000 in 1997. Infant mortality rate (i.e. the number of children who die before their first birthday out of every 1000 live births) fell in the UAE from 145 per 1000 in 1960 to 65 per 1000 in 1975, to 54 per 1000 in 1980, to 19 per 1000 in 1992, and to 9 per 1000 in 1997. On the other hand, life expectancy at birth, the average number of years members of a given population are expected to live, rose in the UAE from 53 years in 1960, to 65 years in 1975, and to 74.8 years in 1997.

It can be argued that the UAE has high health standards compared with other developing countries and even with some developed countries (see Table 4). Measures of malnutrition, mortality and morbidity show impressive improvement in the last two decades. Epidemics have been eliminated and diseases have declined as causes of death. Both crude and infant death rates have fallen, and life expectancy had risen to 74.8 years by 1997. Credit for continued improvement since the formation of the UAE in 1971 belongs primarily to the UAE Federal Government, which has consistently accorded a high priority to improving the health of its population.

Table 4. International human development comparisons 1997

Indicator	UAE	All Developing Countries (average)	All Industrial Countries (average)
Real GDP per capita ($)	19,115	3,240	23,741
Human Development Index (HDI)	0.812	0.637	0.919
Life expectancy (years)	74.8	64.4	77.7
Maternal mortality rate (per 100,000 live births)	26	491	13
Infant mortality rate (per 1000 live births)	9	64	6
Adult literacy (%)	74.8	71.4	98.7
Population with access to health services (%)	90	..	..
Daily per capita supply of calories	3,366	2,628	3,377

Source: UNDP, Human Development Report, 1999.

Conclusion

The UAE is a very wealthy country, mainly due to its modest population base and huge oil resources. The large budget surpluses achieved have enabled the UAE to accumulate a sizeable current account balance, held mainly by the governments of the individual emirates and partly by other private establishments. Progress has been favourable in social and economic development. The successful implementation of human development policy in the UAE, hand in hand with industrialization, urbanization and modernization, is one of the rare examples of a country which has successfully used income from its huge natural resources for its long-term development over a very short period (from the early 1970s to late 1990s).

It is clear that the UAE has achieved impressive improvements in many social and economic development indicators during the past three decades. This chapter emphasizes the high levels of human development in UAE, together with a relatively good record on human rights. These are goals which must still be borne in mind in attempts to sustain national development.

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Industrialization in the UAE

Shihab M. Ghanem

Introduction

Commercial quantities of oil were first discovered in Abu Dhabi emirate in 1958 and oil exports commenced in 1962, nearly four decades ago. Oil was subsequently found in Dubai and exports began in 1969. The federation of the United Arab Emirates was formed on 2 December 1971, about 13 years after that initial discovery in Abu Dhabi. Undoubtedly, oil and the federation were the two most important factors in the transformation of the seven emirates politically, economically, socially and culturally, from a collection of subsistence desert sheikhdoms into a federated group of modern city-states.

In the pre-oil era the vast majority of the population worked in pearling, fishing, trading and dhow building. According to Al Otaiba (1970), pearling began to flourish in Abu Dhabi about two and a half centuries ago, and just before the Second World War approximately 85 per cent of the population of Abu Dhabi (which was about 55,000 at the time) worked directly or indirectly in pearling, the industry accounting for 95 per cent of the total national income. It was those living on the coast who were the main beneficiaries of this sea-based industry. The oases' inhabitants engaged in subsistence agriculture (animal husbandry, the care of date palms,) and rural handicrafts (the fashioning of silver ornaments, daggers, the weaving of *bishts* from camel hair and pottery), although some of the population shifted between pearling and agriculture according to the season.

After the discovery of oil, it became the mainstay of the economy, and development in the 1960s and 1970s, and to a lesser degree after that, focused on physical infrastructure such as roads, ports, airports, water and electricity supplies and on social infrastructure such as schools and hospitals. The rapid growth of the construction industry required to meet the development in infrastructure attracted large numbers of skilled, semi-skilled and unskilled expatriate workers from a variety of countries, but mainly from the subcontinent and some Arab and European countries. The expansion in population resulted in growth of the building sector, trading, banking and insurance services, while privately owned import-substitution industries producing locally needed materials such as concrete blocks, aluminium windows, furniture and carbonated beverages began to flourish.

The governments of the emirates then decided to enhance the role of the public sector in the development process by investment in manufacturing associated with oil and gas, such

as refineries, fertilizer plants and aluminium smelters, as well as other industries requiring large investments, such as cement factories. In Abu Dhabi, the largest and richest emirate, public sector industrial projects are shared between two main bodies: Abu Dhabi National Oil Company (ADNOC), which is the main organ for implementing Abu Dhabi policy regarding oil exploration, production, marketing and processing, and the General Industries Corporation (GIC), which undertakes non-petroleum related projects.

This chapter outlines the growth of the industrial sector since the discovery of oil and examines the constraints faced. Possible strategies are suggested for the early decades of the new century.

Manufacturing Outside the Oil Sector

Industrial development outside the oil sector was strongly linked to the construction boom, directly via the demands for cement, cement blocks, polyvinylchloride pipes, aluminium windows and furniture, and indirectly through the expansion of the food industry to cope with the large increase in population.

Table 1. Total number of industrial establishments
in the Industrial Register of Ministry of Finance & Industry that employ 10 or more persons

Year	Total Number of Establishments
1990	705
1991	740
1992	857
1993	949
1994	1076
1995	1241
1996	1388
1997	1525
1998	1693
1999	1859

Source: Ministry of Finance and Industry

Table 1 shows the increase in the number of industrial establishments employing ten or more people over the past decade, while Table 2 indicates the number of such establishments by activity and emirate at the close of the century. Table 2 indicates that industrial activity is concentrated in Dubai, Sharjah, Ajman and Abu Dhabi. Dubai has 678 out of the 1859 total number of industrial establishments while Sharjah has 581. However, Abu Dhabi hosts many of the larger industries in the country. Some of the different categories of industry in the UAE are examined below.

Construction-related industries

From the late 1960s industrial establishments related to the requirements of building and construction started to increase rapidly in number. At first small factories manufacturing building blocks, tiles, plastic pipes, water tanks, GRP swimming pools, marble tiles and

Table 2. Number of industrial establishments
registered at Ministry of Finance and Industry employing 10 or more persons as at 31/12/1999

Industrial Activity	Abu Dhabi	Dubai	Sharjah	Ajman	Ra's al-Khaimah	Umm al-Qaiwain	Fujairah	Total
Food & beverages	18	82	42	20	9	6	5	182
Tobacco				1				1
Textiles	1	7	19	11	1	1		40
Garments	9	13	53	65	2		1	143
Leather goods	1	3	6	5			1	16
Wood & wooden products	1	13	14	3		1		32
Paper & paper products	8	23	14	11	2	1	1	60
Publishing	7	33	19	3	2		1	65
Petroleum products	5	4	5	7	1			22
Chemicals	22	47	52	14	4	3	1	143
Rubber and plastic products	21	42	56	23	2	4	3	151
Non-petroleum non-metallic minerals	45	99	64	22	22	9	11	272
Basic metal industries	4	21	12	2	3	1		43
Metal products	41	146	78	28	9	6	4	312
Machinery & equipment	5	16	19	1	1			42
Office equipment and computers				1				1
Electrical equipment & parts	6	25	16	1		1	2	51
Vehicles & trailers	5	12	4	4	1			26
Other transport equipment	3	12	6	10	3	1		35
Furniture & other manufacturing	2	64	85	18	3	1	1	174
Recycling						1		1
Handicraft industries		16	17	7	7			47
Total	**204**	**678**	**581**	**257**	**72**	**36**	**31**	**1859**

Source: Ministry of Finance and Industry, Department of Industrial Development

similar items, made their appearance. By 1973 a large asbestos-cement pipe factory had been built in Dubai, followed within a few years by another one in Umm al-Qaiwain. When the oil prices jumped in 1973, there were still no cement factories in the country. Cement was imported from Belgium, Germany, Kenya, etc. As requirements increased sharply in 1974, other countries, including Egypt, Greece, Pakistan, the Philippines, the Republic of Korea, Romania and Lebanon, began to export cement to the UAE. The first cement factory in the UAE started production in Ra's al-Khaimah in 1975 with an annual capacity of 550,000 tons. More cement factories were built in various emirates until the number reached eleven with an annual capacity exceeding 8 million tons. During the economic slump of the mid-eighties these were working at just over half capacity with nearly half of that production being exported. During that period, a white cement factory was also built in Ra's al-Khaimah which still exports a substantial part of its production to neighbouring Gulf countries.

Most of the cement factories have been built or partly financed by local government, but the private sector contributed heavily in some cases, such as in Dubai. Except for gypsum and some additives, the raw materials for cement are locally available. Local cement is

generally preferred to imported cement because of freshness. The big increase in demand for cement in the 1990s has resulted in the flourishing of the industry. Some production is exported.

The cement industry has helped the development of a downstream building materials industry such as asbestos-cement pipes and sheets, concrete building blocks and tiles. It is natural to consider manufacturing pipes both because of the need for them in the infrastructure as water supply lines but also because the import of pipes incurs heavy transport costs due to their large volume, when most of the volume in fact is empty space. (The same could be said about transporting tanks.) In addition transporting pipes exposes them to shock and, therefore, cracks. Moreover, in the case of cement pipes most of the raw materials are available locally.

There are two asbestos-cement factories in the UAE. A pipe factory opened in Dubai in 1973, even before the development of the first cement factory, and a pipe and sheet factory was installed in Umm al-Qaiwain during the late 1970s. However, because of the environmental problems connected with asbestos (even though the more dangerous blue asbestos has been phased out), a large number of GRP, PE and PVC pipe factories have appeared in the various emirates over the years and have taken some of the market share of the asbestos-cement pipes. The many medium and small concrete block, interlock and tile factories which were established now not only cover most of the country's needs but also export a substantial portion of their production.

A total of nine factories for making reinforced steel bars from scrap iron have been built in the UAE but four of these have closed down and the remaining five produce a total of 100 thousand tons annually, which is less than one tenth of local demand. A large factory is planned for Abu Dhabi and once this is in operation it will reduce imports substantially.

The first paint factory was opened in 1975. By 1996 there were 21 paint factories producing about 100 thousand tons annually with about one fourth of the production exported. Although most of the basic materials for manufacturing paints are imported, the high water content in most paints for use in building makes it economical to manufacture the paints locally in order to reduce transport costs. However, many special paints, such as marine paints and motor vehicle paints, are imported.

Many carpentry shops have been established to supply the construction industry with such items as doors, windows, partitions, pre-fabricated buildings, with the number of larger units employing more than ten persons reaching 33 in 1996. As for furniture-making factories, those employing more than ten persons reached 64 in the same year.

Food processing and beverages

Factories for making beverages commenced operation in the late 1960s. The number of factories for food processing and beverages with a labour force of more than ten reached 80 in 1985. By 1996 there were 130 factories, and by the end of 1999 there were 182. These include a large sugar factory and a few flour mills. The remaining units are for meat or fish processing, milk and dairy products, vegetable oil and animal fat processing, canning of fruits, vegetables and legumes, soft drink factories, mineral water bottling factories and three factories for animal feed.

Textiles, wearing apparel and leather goods

Ready-made garment factories mushroomed during the second half of the 1980s, reaching about 150 in number. The attraction was the benefits to be gained from access to the UAE

quota for export to the West, in particular the United States. There was no appreciable increase in the 1990s. In fact some factories closed down because the quota had been exhausted, with 143 remaining at the end of the century. Most of these factories are located in Sharjah and Ajman, with some in Jebel Ali Free Zone.

Except for four of these establishments where the investment exceeds 10 million, most of the others are small with a capital investment of less than half a million dirhams for each factory. It is a labour-intensive industry, using an average of over 140 people per factory, 80 per cent of whom are generally young females aged 17 to 25 years, most from Sri Lanka.

The bulk of production is shipped to the USA and the EU with most of the seconds exported to Eastern Europe. By the time the quota system is abolished in 2005, this industry will be too well established to be seriously affected. It is considered the second largest manufacturing industry in the UAE after aluminium and constitutes about 15 per cent of the non-oil industrial exports. The banks are usually happy to provide the industry with finance. Some of the more factories are more sophisticated, using a higher level of technology and these are mostly located in Jebel Ali. There are also a few factories in the UAE for leather products.

Paper, paper products and publishing

Publishing establishments have developed over the years to meet local demand, with the number reaching 65 by the end of 1999, half of which are in Dubai. As for units manufacturing paper or paper products, 60 were in operation at the end of 1999. A few of these are paper mills using recycled paper as raw material with one factory in Jebel Ali using pulp to make tissue paper.

Metal products, machinery and equipment

By the end of 1999 there were 312 factories dealing in such metal products as aluminium windows, metal furniture, cooking utensils, etc. There were also 42 factories connected with machinery and equipment such as air-conditioners and electric distribution panels.

The Dubai government built a large cable factory in Dubai in collaboration with a UK manufacturer, and Abu Dhabi has recently taken a share in the factory.

A large number of mechanical workshops exist in the UAE, including an extensive workshop in Dubai Drydock, probably the largest drydock in the world and capable of handling tankers with a capacity of up to 1 million tons.

Basic metal industries

The most important factory producing a basic metal is DUBAL, the Dubai Aluminium Company. Its smelter, which started production in 1979, was set up to benefit from the available associated gas. DUBAL imports alumina via the adjacent Jebel Ali Port and exports the metal ingots produced in containers through the same port. The aluminium produced is of 99.86 per cent purity, one of the highest in the world. Production was 170,000 tons in 1990, increasing to 245,000 tons in 1994. The factory has since undergone expansion, and, with current yearly production running at more than half a million tons, it is now one of the largest aluminium smelters in the world. Aluminium metal, which is mainly exported to Japan, is considered the second most important export item in the UAE after oil. This sophisticated industry has played an important role in the training of UAE nationals in technology.

Oil-Related Industries

Table 3 indicates the production and export of oil from the UAE between 1976 and 1995. The UAE's proven reserves are estimated at about 98 billion barrels, almost 10 per cent of the world's reserves.

Table 3. Production and export of crude from UAE		10,000 BPD
Year	**Production**	**Export**
1976	1936	1928
1980	1702	1605
1985	950	832
1990	2062	1785
1991	2320	2117
1992	2240	2011
1993	2190	1902
1994	2160	1930
1995	2160	1936

Source: *Development Indicators in the UAE – Achievements and Expectations*
The Department of Research and Studies
The Diwan of HH Crown Prince, Abu Dhabi, 1996.

Abu Dhabi National Oil Company (ADNOC), which was established in 1971 to oversee the oil and gas industry in Abu Dhabi, has become one of the world's leading oil companies, with substantial business interests in upstream exploration, development, production and marketing of oil and gas, and downstream refining, distribution and marketing of petroleum products, as well as liquefied natural gas (LNG) production and marketing. It owns and operates two refineries at Umm al-Nar and Ruwais, a gas treatment plant at Habshan, a gas pipeline distribution network and chlorine industries at Umm al-Nar.

The ADNOC group of companies operates in all sectors of the oil and gas industry, including drilling, construction, marine services, fertilizers, shipping and distribution. The group consists of three main oil operating companies, five support companies providing services to the oil and gas industry, three joint ventures to utilize fully the produced gas, two maritime transport companies for crude oil, refined product and LNG and one refined product distribution company. The three main oil and gas operating companies are: Abu Dhabi Company for Onshore Oil Operations (ADCO), Abu Dhabi Marine Operating Company (ADMA-OPCO) and Zakum Development Company (ZADCO).

ADCO, the largest crude oil producer in the southern Arabian Gulf, undertakes exploration, drilling, production and export activities in Abu Dhabi's onshore areas and the shallow coastal waters.

ADMA-OPCO operates the exploration, development and production activities of oil and gas in Abu Dhabi's offshore concession area. Oil and gas production comes from two fields: Umm Shaif and Zakum. The output of oil and gas from these fields is transported to the company's centre of operations on Das Island for processing, storage and export via the island's terminal.

ZADCO was established in 1977 to develop and operate the Upper Zakum field, one of the largest fields in the world, on behalf of ADNOC and Japan Oil Development Company (JODCO). Besides Upper Zakum, the company currently operates the Umm al-Dalkh and Satah fields.

In Dubai, oil in commercial quantities was first discovered on 6 June 1966 at the Fateh field by Dubai Petroleum Company (DPC) and was first exported on 22 September 1969. DPC later developed the offshore fields of south-west Fateh, Falah and Rashid. Currently production is about 170,000 barrels per day (b/d).

Arco International Oil & Gas Company (ARCO) made a gas/condensate discovery onshore at the Margham field and production started in 1982. Current production is about 6000 b/d of condensate.

In Sharjah the BP Amoco Sharjah Oil Company is producing 40,000 to 45,000 b/d and about 700 mn cu ft/day (cfd) of gas from the Sajaa, Moveyeid and Kahaif onshore fields. Crescent Petroleum markets nearly 5000 b/d of condensate from the Mubarak off-shore field.

Oil refineries

The first oil refinery in the UAE was opened in 1976 on the island of Umm al-Nar in Abu Dhabi with a capacity of 15,000 barrels per day to cater for local requirements. This factory was expanded in 1983 to produce 75,000 b/d of naptha, gasoline, kerosene, diesel and fuel.

In 1981 a larger refinery, with a capacity of 120,000 b/d, was opened at Ruwais in the emirate of Abu Dhabi. Its capacity was upgraded to 132,000 b/d in 1995. Ruwais produces similar products to Umm al-Nar plus ship fuel and sulphur. Liquefied gas is also produced which is sent to GASCO for treatment. The two refineries at Ruwais and Umm al-Nar refine about 10 per cent of Abu Dhabi's oil, the rest being exported as 'crude'. They are amongst the highest performing refineries in the world in terms of return on investment.

In 1999, the Dubai government-owned Emirates National Oil Company (ENOC) opened its condensate processing plant EPCL at Jebel Ali to produce up to 120,000 b/d of aviation fuel, diesel, naphtha and fuel.

In Sharjah, the Sharjah Oil Refining Company Ltd (SOR), the latest addition to the Fal Group, is currently constructing a refinery at al-Hamriyah with a capacity of 35,000 b/d. This will run mostly crude oil and plans to expand to 60,000 b/d.

In Fujairah the 35,000 b/d Greek-owned Metro Oil Corporation refinery went into service in 1996 but was then closed due to financial problems. It re-opened in 2000 as the Fujairah Refinery Company with Fujairah government support. The total capacity will be expanded to 90,000 b/d and the refinery will now produce kerosene and jet fuel as well as fuel oil and gasoline. It is worth remembering that Fujairah is the third bunkering port in the world after Rotterdam and Singapore, supplying 600,000 to 800,000 mn tons of fuel oil per month. Shareholders in the bunkering tank farm include Van Ommeren, ENOC and the Fujairah government.

The UAE has thus been able to rely on itself almost entirely for its requirements of refined products. Moreover it has been able to provide inputs for downstream industries. The Gulf Cooperation Council together refines about 15 per cent of its total crude and this percentage is expected to rise to 21 per cent in 2007 (*EIB Journal*, September 1997).

Liquefied gas

In the early years of oil extraction in the UAE associated gas was flared, but when prices of oil jumped in 1973 interest in gas rose sharply. In 1974 the UAE produced 500 bn cu ft of gas of which 1.5 per cent was used by the oil companies, 1.5 per cent by Abu Dhabi to produce electricity and desalinated water and over 93 per cent flared. By 1980, nearly half of the gas was utilized either through liquefaction for export or for use locally, and by 1983 Abu Dhabi was utilizing 92 per cent of its gas.

World gas reserves are estimated at 150 trillion cu m of which 6trillion cu m (4 per cent) are in the UAE. Abu Dhabi has 92 per cent of the UAE reserves while Sharjah and Dubai have 5 per cent and 2 per cent respectively.

The UAE also has large reserves of non-associated gas. About 55 per cent of UAE gas is used locally whilst the rest is exported. ADNOC owns the gas related projects in Abu Dhabi, Abu Dhabi Gas Liquefaction Company (ADGAS) and Abu Dhabi Gas Industries Ltd (GASCO).

ADGAS is a liquefied natural gas project which was established in 1973 and set up on Das Island in 1977. It produces 2.3 mn tons of LNG and 1.4 mn tons of LPG from the offshore fields crude oil.

GASCO, one of the largest gas processing companies in the world, was set up in 1981 to treat associated gas from three onshore fields as well as non-associated gas from another field. It supplies Ruwais and Abu Dhabi with gas as fuel for the generation of electricity and also supplies the petrochemical industries with feed-stock. The majority of gas produced is, however, exported.

Dubai Gas Company (DUGAS) was built at Jebel Ali in Dubai in 1980. It treats associated gas and collects condensate, butane and propane for export while methane and ethane are sent to the Dubai Electricity and Water Authority for the production of electricity and desalinated water and to DUBAL for aluminium smelting.

SHALCO was set up in Sharjah in 1986 for liquefaction and export of gas from the onshore fields. It also supplies Sharjah's gas requirements for electricity generation and water desalination. Moreover, it supplies DUGAS in Dubai with about 95 mn cu ft of gas per day.

The establishment of Ruwais Fertilizer (FERTIL) in 1980 to produce fertilizers for both domestic use and export was a joint venture between ADNOC and Total.

One of the most important developments in the UAE gas industry is the Dolphin Project which aims to develop links between the gas infrastructure of Qatar, the UAE and Oman, with a possible future link to Pakistan. This will allow the export of non-associated gas from the massive offshore North Dome field of Qatar. A statement of principles for the project was signed in March 1999 between the Qatar General Petroleum Corporation and the UAE Offsets Group (UOG). The project is estimated to cost $8 to $10 billion over six to seven years. In the first phase, to be completed by the end of 2002, the subsea pipeline will transport 1200 mn cfd of natural gas. This will be raised to 3000 mn cfd in the second phase. Dolphin is the largest programme of its kind in the world and will account for nearly 10 per cent of total world gas supply. In the initial phase the supply will be almost exclusively for supplying gas-fired power plants.

A pipeline is currently under construction to supply Dubai with about 800 mn cfd from Abu Dhabi's offshore field of al-Bukhoosh via Jebel Ali for electricity generation and water desalination. In time, this is expected to be integrated into the Dolphin project.

Industrialization in the UAE and its Resources

The rationale for industrialization in the UAE is the diversification of an economy which is heavily reliant on oil. A Ministry of Planning publication (1983: p 58) states:

> *Industrialization is a main aim of the state for the correction of the structure of production in which the crude oil sector accounts for about two thirds of the GDP. The industrial sector, according to economic criteria, is the sector on which economic efforts should be concentrated.*

The above statement dates back to 1983. Table 4 shows that the non-oil sector's contribution to GDP rose from 36.73 per cent in 1980 to 77.64 per cent in 1998, while the contribution of manufacturing has increased from 3.76 per cent in 1980 to 12.40 per cent in 1998. Even so, reliance on the oil sector is still high.

Exporting refined rather than crude oil enables the UAE to benefit from the value-added component. Moreover, the availability of associated gas which necessarily accompanies oil extraction provides feedstock for petrochemical industries and fuel for energy. In addition

Table 4. Gross domestic product at factor cost by economic sector 1975–1998

(Dh. million at constant prices)

Sector	1975	1980	1985	1990	1995	1998
Agricult., livestock & fishing	367	827	1,440	2,056	3,550	5,509
Mining & quarrying:						
Crude oil	35,820	70,532	44,707	57,632	49,200	34,002
Others	118	235	309	307	450	572
Manufacturing	472	4,191	9,255	9,701	12,500	18,855
Electricity & water	287	1,297	2,143	2,461	3,210	2,750
Construction	4,770	9,834	8,882	9,687	13,300	14,278
Wholesale, retail trade,						
Restaurants & hotels	4,940	9,094	8,715	11,237	17,800	20,813
Transp./storage, comm.	1,608	3,731	4,224	6,211	8,500	10,663
Financing, insurance, real estate:						
Financing & insurance	825	2,123	5,154	5,126	7,150	10,112
Real estate	1,326	4,006	5,176	6,864	11,700	15,935
Other services	516	814	1,645	2,467	1,640	3,008
Less imputed bank charges	(600)	(1,403)	(1,025)	1,950)	(2,550)	(3,774)
Government services*	2,551	5,989	11,001	12,968	16,320	18,005
Domestic services	54	200	364	499	1,200	1,302
Total	**53,054**	**111,470**	**101,990**	**125,266**	**143,970**	**152,030**
Non-oil sectors	17,234	40,938	57,283	67,634	94,770	118,028
Non-oil sectors %	32.48	36.73	56.17	53.99	65.83	77.64

Source: *Economic & Social Development in the UAE*
1975-80, 1980-85, 1985-90, 1990-95, Ministry of Planning, UAE
The Annual Economic Report 1999, Ministry of Planning, UAE.
* Includes education, health services, and the various ministries and government departments

industrialization plays an important role in the development of technology and a well-trained national labour force.

Industrial development requires various factors and resources and some of these will be examined below.

Labour force

Table 5. Population and labour force (in 1000's)

	1975	1980	1985	1990	1995
Male population	386	720	895	1115	1580
Female population	172	322	484	729	797
Total population	558	1042	1379	1844	2377
Labour force	288	541	619	694	1290
Percentage of labour force to total population	51.6	51.9	44.9	37.6	54.2

Source: Development Indicators in the UAE – Achievements and Expectations
The Department of Research and Studies. The Diwan of H.H. The Crown Prince, Abu Dhabi, 1996

Table 5 indicates the growth of population and labour force in the UAE between 1975 and 1995. The population has increased from 558,000 in 1975 to 2.37 million in 1995. This increase has been mainly achieved by the influx of expatriate workers. The percentage of labour force to total population is over 50 per cent because a large portion of the population consists of expatriate workers. Females constitute about one third of the population because most expatriate workers are male.

Table 6. Labour force in manufacturing sector

	1975	1980	1985	1990	1995
Labour force in manufacturing (A)	17505	39200	95100	66530	99400
Total labour force (B)	288414	541033	619429	694201	955100
Percentage of A to B	6.0	7.2	9.5	9.6	10.4

Source: Development Indicators in the UAE – Achievements and Expectations
The Department of Research and Studies. The Diwan of H.H. The Crown Prince, Abu Dhabi, 1996

Table 6 shows that the labour force in manufacturing is about 10 per cent of the total labour force in the country. Surveys of industries conducted by Dubai's Chamber of Commerce and Industry (1984), the Federation of Chambers of Commerce in the UAE (1983) and by the author in 1987 (Ph.D. thesis 1989) indicated that industry did not suffer from a shortage of manpower, since there were no restrictions to the inflow of the necessary expatriate labour force, skilled and unskilled. There are very few nationals working in the industrial sector. However, with nationals graduating from universities and colleges of technology in thousands every year and with the government sector becoming saturated, nationals are increasingly seeking employment in both the public and private industrial sector.

Industrial areas and infrastructure

When industrial development commenced in the UAE there was no proper town planning and industries were allowed to locate in areas unsuitably close to town centres. Later, when industrial areas were designated, some industries were asked to relocate. For instance several large enterprises engaged in fabrication for the oil industry were requested to move to

Jebel Ali. In addition to Jebel Ali's heavy industry area, Dubai municipality has designated seven areas (as indicated in Table 7), zoned for light, medium, heavy and hazardous industrial activity.

Table 7. Industrial areas in Dubai

Name of area	Area in hectares	Percentage of area in use
Al-Khubaisi	102	93
Al-Qusais	312	60
Al-Rumool	391	98
Al-Aweer	661	65
Al-Quoz	1,552	22
Al-Safa	114	17
Total	3,132	47

Source: Dubai Structural Plan. Study Report by Parsons, Harland Bartholomew & Ass., (1994).

The other emirates have also designated areas for industry with Abu Dhabi, for instance, allocating 1400 hectares in Musafah and 400 hectares in Al Ain. The various emirates have also seen considerable development in infrastructure and utilities: roads, ports, airports, electricity, water supply, sewerage and telephone lines.

Free zones

Because of the success of Jebel Ali Free Zone, free zones have been developed in all the emirates. With a total of nine free zones, the UAE has more free zones than most other Arab countries.

Table 8 shows the sizes of the various free zones, the date of their establishment, the number of companies located in each of them and their activities. Jebel Ali is the oldest and largest one in the UAE and today has approximately 1600 companies, of which about 22 per cent are industrial, mainly light and medium industries. However, they occupy a greater area than this percentage might imply since industrial establishments generally require a great deal of space. According to a study dating 1995/96 the percentages of industrial projects to the total number of projects in the free zones were: Sharjah 17.7 per cent, Fujairah 39.8 per cent, Ajman 41.3 per cent and Umm al-Qaiwain 100 per cent, (Nawar 1998).

Jebel Ali's success is due to the fact that it was built around the largest man-made port in the world (70 berths). It has a developed infrastructure with a modern management system and strictly implemented environmental and health and safety regulations. Several free zones, mostly from the Arab world, have recently signed consultancy agreements or memorandums of understanding with Jebel Ali Free Zones Authority management to benefit from its experience. Another important advantage is that proximity to the sea permits large projects to use a convenient source of cooling water, though it should be noted that the construction of a huge inland canal to provide cooling water in Jubail Industrial Area in Saudi Arabia has facilitated the building of various large projects several kilometres from the sea.

The attraction of the free zones is that foreigners can have full ownership of their projects (except for the land which is usually leased) and there are no customs duties on imports unless they cross the fence into the UAE. There are also no restrictions on the movement of capital and repatriation of profits and, so far, there are no restrictions on bringing labour from overseas.

Table 8. Free Zones in the UAE

Location of Free Zone	Date of Establishment	Area in Hectares	No. of Companies at beg. of 1999	Activity
Jebel Ali (Dubai)	9/2/85	10,000	1343	74% Trading 22% Industrial 4% Services
Fujairah	Nov. 1987	140	80	Trading and Industrial
Ajman	1988	More than 100	375	Trading and Industrial
Umm al-Qaiwain	1/4/88	110	About 35	Trading and Industrial
Sharjah Airport	8/5/95	1,000	318	67% Trading 23% Services 10% Industrial
Hamriyah (Sharjah)	12/11/1995	Approx. 1,000	8	Clean Industries
Dubai Airport	1996	120	35	Mainly high-tech
Ra's al-Khaimah	Dec. 1996	150	0	Clean Industries (Only Free Zone in UAE operated by Private Sector)
Sadiyyat (Abu Dhabi)	July 1996	3500	0	Mainly for Commodities
Total		**Approx. 16120**		

Source: Prepared by Author

Raw materials

The most important raw materials for industry in the UAE are oil and gas. Apart from the creation of more refineries and liquefaction projects, there exists the possibility of developing the petrochemical industry in a way similar to that achieved by Sabic in Saudi Arabia. The UAE has been slow to diversify in that direction, with FERTIL, the fertilizer plant in Abu Dhabi, being one of a limited number of such developments.

In fact, the Arab region, particularly the Gulf, is ideally placed to develop an advanced petrochemical industry. This should be accomplished in such a way as to avoid duplication of projects, thus eliminating over-production and price falls in the region. Several Arab countries produce the basic products ethylene and methanol from gas, or, in the case of Libya, from naphtha. They also produce smaller quantities of propylene and butadiene and aromatics. Some Arab countries go one step further and produce middle products while a few countries, like Saudi Arabia, produce final downstream products like PE, PVC, polypropylene and polybutadiene.

Recently the UAE considered setting up a major industrial company, Sina'at, mainly to develop the petrochemical industry. The proposed capital of Dh 4 billion was to be raised in the form of issuing shares to the public, but the project seems to be on hold.

Surveys for minerals other than oil and gas have been limited in the UAE, but preliminary reports indicate the presence of mica, chromes, gypsum, copper and manganese. The only

minerals that have so far been exploited on a large scale are those needed for the cement industry.

The UAE has been keen to develop its agriculture despite the very limited arable land and water resources, and has achieved production of some vegetables in excess of local needs. Canning of such production could be expanded.

As would be expected, in view of its lengthy coastline, the UAE has a successful indigenous fishing industry, ranked fourth in the Arab world and second among AGCC states in the volume of its annual catch. With the fish catch rising, but the average catch per boat declining, the Ministry of Agriculture and Fisheries is keen to protect the fishing industry and has placed legal restraints on fishing to conserve fish stocks. Thus fish processing can expand only in a controlled way. An example is Ocean Fish Processing LLC which was allowed to be set up in 1999 as an offsets project with an initial investment of US $1.5 million.

Capital

The country has a well developed banking industry. However commercial banks are generally not geared for investment in industry. The UAE created the Emirates Industrial Bank (EIB) in 1982 to finance industrial projects set up within the UAE and in which participation of nationals is at least 51 per cent. The participation of the bank can be up to 60 per cent of the project capital or 20 per cent of the bank's total paid capital, whichever may be lower. The bank charges 4 per cent interest plus .5 per cent administrative charges. The bank gives priority to projects using modern technology and which are capital-intensive rather than labour-intensive. It also gives priority to projects that use local raw materials and produce import-substitution goods. By the end of 1997 the bank had approved 225 projects with total loans of Dh 1439 million.

The General Industries Corporation in Abu Dhabi also created a fund of Dh 100 million for the encouragement of industrial projects in the emirate. The fund can participate with up to 50 per cent of the capital of an industrial project. It employs the same criteria as the EIB when assessing projects for approval and projects are given priority on similar grounds.

As a further stimulus to diversification, Abu Dhabi operates an offsets programme which aims to encourage small, medium and large industrial projects. The UAE has made it a condition that foreign companies bidding for lucrative defence contracts should invest a portion of the value of the deal in joint venture projects with local partners. The programme is managed by the UAE Offsets Group (UOG). Under the programme, foreign defence firms are entitled to hold a stake of up to 49 per cent in the joint ventures. Projects must generate added value within seven years. Between 1992 and 1999 the project financed 31 projects, 17 of which were in operation with a total investment of about Dh 2 billion. The projects include The Oasis International Leasing Company for leasing aircraft, TABREED for developing innovative cooling systems, a plant for manufacturing fire-fighting materials and a fish processing company. In 1999 UOG also announced its participation in the Dolphin project.

Finally one must remember that the UAE now has a large number of experienced businessmen who in the past would have engaged mainly in trade and contracting. In recent years many of these have gained some industrial expertise, and have set up small and medium factories and even a few larger ones.

Policy

The development of industry in a country is affected considerably by legislation and policies of central and local governments. The UAE Government has promulgated laws for the organization of industry and labour. The main legislative instrument governing industrial affairs is Federal Law No. 1 of 1979. Local industrial production is defined in this law as one in which the local part of the manufacturing costs is not less than 25 per cent of the total. The law applies to all industrial projects other than federal government projects, oil and gas extraction and refining, mineral raw materials refining, and small projects with a fixed capital less than Dh 250,000 or employing not more than ten persons. The law appoints an industrial committee under the chairmanship of the Minister of Finance and Industry, the membership of which includes the under-secretaries of the ministries of Finance and Industry, Economy and Commerce, Planning, Labour and Social Affairs, Petroleum and Mineral Resources, and Electricity and Water, plus a citizen from each emirate, and two UAE industrialists. The committee studies applications for setting up industrial projects and exemptions and incentives requested, and decides by majority. The law requires at least 51 per cent of the capital to be local, and that the manager and the majority of the board of directors also be UAE citizens.

According to the law, projects are considered in the light of:

- Requirements of the economic and social plan, and the industrial development programmes in the country.
- Agreements with Arab countries.
- Local consumption requirements and import substitution.
- Extent of availability of local raw materials to be used in the manufacturing process.
- Possibility of carrying out the project in one of the areas chosen by the Government.

Because the UAE is a strong believer in laissez-faire economics, there has been a lack of protection for local industry despite strong pressure from these industries in the early days of industrialization. The lack of protection has, in fact, forced local industries to ensure that their products are of high quality in order to compete with imported goods.

Law No. 1 of 1979 stipulates that industrial projects should employ a minimum of 25 per cent of local employees. However, the Minister of Finance and Industry may decide to reduce or waive this ratio if sufficient citizens are not available and, in fact, UAE industries have still not been able to achieve this minimum.

In 1986, Ministerial Decision No. 51 was passed whereby local products equivalent in quality to foreign products but up to 10 per cent more in price were to be given preference in government purchases.

A federal labour law was issued in 1980 (Law No. 8 of 1980) which governs the rights, responsibilities and duties of employers and employees. It covers both indigenes and expatriates but it does not apply to government employees, small establishments employing not more than five people, or domestic servants. The law covers such matters as contracts, minimum wages, working hours, vacation, sickness benefits, training, disciplinary code and work disputes. Trade unions are not permitted in the UAE.

Other laws related to industry include Federal Law No. 14 for the year 1976 regarding the establishment of the Department of Standards and Specifications, and Federal Law No. 44

for the year 1992 for the regulation and protection of the industrial ownership of inventions and designs. There are also various laws related to industry such as environmental and health and safety laws and regulations issued by the local governments, the free zone authorities or by the Federal Environmental Agency. Industrial projects that wish to manufacture medicines have to obtain the prior approval of the Ministry of Health.

Conclusion

In this final section we suggest some general strategies that could be suitable for industrialization in the United Arab Emirates.

Because of the small population base and the availability of capital, industrialization should be capital-intensive. A sophisticated or high-tech industrial sector requires a highly trained and educated labour force. The spread of education, including tertiary education and, in particular, higher colleges of technology, should be able to produce nationals with the required skills. However, it is necessary to ensure that the education system is modern and fully related to the requirements of the work market. The education system has tended in the past to depend on learning by heart rather than on developing creativity and innovation.

The Government should think of establishing a higher authority for scientific research. The federal or local governments should seriously consider establishing science parks near the universities or industrial centres. These should include what are known as incubators for innovative young educated nationals to develop their technical ideas into commercially viable innovations. The Internet-City project recently started in Dubai is intended as one such science park. There is also a project in Abu Dhabi called CERT (Centre for Excellence in Research and Technology) built on the Higher College Technology Campus and this centre concentrates on high-tech training.

Industries depending on hydrocarbons should be the spearhead of industrial development in the UAE. However the UAE should coordinate its efforts in this field with GCC countries and other oil-producing Arab countries in order to avoid over-duplication of projects with subsequent negative effects on prices and sales. The UAE should also coordinate research activities in this field with the other GCC countries with a view to making the region one of the most advanced in the world for the development of new materials and processes in the petrochemical industry.

The UAE should develop certain industries whose products are particularly required by the region. Examples of the fields that could be investigated are desalination, solar energy and air-conditioning. The region imports desalination and air-conditioning plants at great cost. Research may lead to the development of more effective ways of desalination. The Gulf countries could focus on fields such as the ones mentioned above and work together on related R & D projects.

The creation of a federal body or association for the free zones in the UAE could be beneficial to all of them. Coordination of effort in fields such as those related to environment and customs would facilitate the achievement of more sustained industrial development.

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Environmental Development and Protection in the UAE

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Introduction

The United Arab Emirates is a predominantly arid land containing habitats and communities adapted to survive both small amounts of infrequent precipitation, and extremes of heat with consequent high evaporative losses. It is an exacting environment. Nonetheless, mankind has exploited the land now known as the UAE since the Late Stone Age, 7500 years Before Present (BP), although then the climate was wetter than it is today. Game would have been abundant on the Acacia savannah and neighbouring grasslands and even in the deep sands the basic necessities of life would have been available. Only the ingenuity and technology to exploit these resources would have been required to survive in relative affluence. Since those times there has been a trend toward increasing aridity, demanding a nomadic hunter-gathering lifestyle. It was solely in the relatively well-watered Hajar Mountains, with their permanent running supply, that cultivation would have been possible, a development which took place only in antiquity. Terraced fields there attest to such an agricultural economy (see Heard-Bey, this volume). Today this system has fallen into disuse, although the proximal cause was a shift in the socio-economic base rather than necessarily the increasing irregularity of winter rainfall.

The marine environment would, quite naturally, have proved the focus for human activity, assuming freshwater sources existed in the vicinity. That they did is known from the archaeological record (see Potts, this volume), with evidence from some island localities of continuous occupation over at least the past four or five millennia (Hellyer 1998, 1999). Even today, in perhaps the driest period the UAE has ever experienced, there are still potable supplies, including on some of the offshore islands where rain itself rarely falls. (The island of Dalma, as can be recalled by many still today, once provided drinking water to the fishing settlement which later grew to become the city of Abu Dhabi, capital of the UAE!) Recent anecdotal accounts provide confirmation of a long-suspected assertion that submarine freshwater springs would once have been utilized to sustain certain coastal and island communities.

In contrast to the past, when the human population was still small and natural resources were used sustainably without conscious effort, a burgeoning human population, increased longevity and commercial exploitation have served to put mounting pressure on the environment. Commercial fish catches in the Arabian Gulf continue to decline, for example, despite a general

awareness of basic ecological limitations. The increased effort, measured in an increasing size of the fishing fleet required to secure the same annual landings, has not gone unnoticed.

Much other wildlife is under threat. In the marine environment, dugongs, turtles and seabirds may be being driven close to extinction locally through a range of causes, singly or in combination, and including: insensitive development, habitat loss, illegal persecution and unsustainable harvesting. The scenario is apparently similar in terrestrial settings, with grazing pressure from domestic livestock at very high levels and the populations of indigenous ungulates, carnivorous mammals and several species of indigenous birds at a low ebb. Threats to the integrity of the natural world on a global scale are well documented and a lack of environmental impact assessment or study has allowed, hitherto, large scale and widespread losses of important habitats and wildlife resources. It is this situation which the UAE is now, institutionally speaking, in a position to address and redress, with enabling legislation firmly on the statute books.

The UAE has undergone something of an environmental renaissance in recent years. Environmental awareness is high on the agenda and reminders are constant of our obligation to the natural world, and none more so than in the particularly sensitive environment of the southern Gulf. There is now, in addition to the governmental structure, a plethora of non-governmental environmental groups and a clear conviction exists across the board amongst federal bodies, individual agencies and non-governmental organizations, together with their domestic and international alliances, of the need for environmental protectionism.

Sophisticated environmental legislation has been promulgated, involving several separate laws. Some apply at a federal level, others only at individual emirate level. There is a clear move toward consistency across the federation, although each emirate retains, constitutionally, a certain degree of overall autonomy. The task of putting into practice what is enshrined in such laws, backed up by monitoring and strict enforcement, is now being addressed. The UAE is endeavouring to restore the balance and ensure resources are used both sustainably and equitably, while at the same time maintaining a place for nature.

Before providing a description of the UAE environment and the organizations responsible for its upkeep, it is appropriate to provide a brief note of the relationship between Arab tradition and culture and the natural world.

The Holy Qur'an makes frequent reference to animals and plants and instructs all Muslims to study and appreciate living and non-living things around them. In such a harsh environment as exists in Arabia, where the vagaries of the weather make for additional uncertainty, the peoples of the desert lands have had to make their living frugally, even during times of plenty when a surplus may have been available. Plenty is a relative term, however, and meagre resources would have generally had to suffice.

A land management system evolved to ensure lean periods could be weathered. *Harim* and *hima* lands were set aside (by individuals, communities or the state) for grazing only during drought, something which could be the norm rather than the exception. Nomadism was typical in many areas, to avoid overexploitation of available resources. Coastal communities were somewhat better off for food, although water supplies remained similarly scarce. Close to the Hajar Mountains, part of the UAE's population once comprised transhumant pastoralists and farmers who retired to the hills in spring to cultivate terraced fields, but otherwise resided along the coast. Their lifestyle was not a choice, but a necessity, thrust upon the community by the severity of the environment (see Heard-Bey, this volume).

Modern times have brought inevitable changes, but many traditions survive. The tradition of falconry still continues, for example, possibly remaining as popular as ever. Today, however, the hunt is not necessary to provide fresh meat as was formerly the case, while the chase itself is certainly more efficient. Many falconers have moved with the times in recognition of this fact. Captive-bred falcons are particularly popular, serving to assist in the conservation of wild-raised birds, while high-tech scientific studies and ecological research aim to ensure that any harvesting of wild birds is sustainable. By a process of education and diffusion, rather than legislation, it is hoped that this lead will be generally adopted by all practitioners. This example is given deliberately to demonstrate a system, perhaps alien to outsiders, which can nonetheless succeed as well as, if not better than, any other.

The section immediately following briefly describes the climate, topography, biogeography and natural ecosystems of the UAE. This scene-setting is followed by an overview of the political and institutional framework relevant to the environment, and thereafter by a resumé of the relevant domestic legislation and international conventions relating to wildlife and the environment.

Climate, Topography and Biogeography

Straddling the Tropic of Cancer, the climate of the UAE is hot; on the coast, humidity reaches over 90 per cent in summer and autumn. Inland it is far less humid, although the temperature is higher, often exceeding 50ºC before midday in July. The officially published temperatures are actually the precise air temperature. During the winter period daytime temperatures are generally in the mid-twenties, although, unlike in summer, nights can be relatively cool, down to 12–15°C, and less than 5°C in the depths of the desert or high in the mountains.

In most years it rains during the winter months, usually in February or March, but occasionally earlier. Squalls are the result of the subtropical jetstream re-routing depressions through the Mediterranean basin, these then tracking down the Gulf toward the Arabian Sea. Winter rains take the form of torrential frontal and orographic downpours, which, if occurring in the Hajar Mountains, runs off rapidly into wadis and thence onto the downwashed gravel plains, perhaps reaching the sea on the East Coast, but invariably braiding widely and soaking rapidly into the desert on the west side piedmont. Further west and along the coast, rainfall is often trapped on the *sabkha* (salt flat) surface until it evaporates or soaks away. Inland, surface water seldom remains for more than a day or two, except where artificially ponded or dammed.

Mainly localized thunderstorms occasionally reach the UAE in summer, their annual frequency varying widely. Generally appearing over the mountains of the south and east of the country, these rumbling convective cloudbursts, a break-away from the south-west monsoon affecting southern Arabia, give rise to severe flash floods. For the most part, the *shamal* (north-west wind) typical of summer, being drawn toward the low pressure associated with this monsoon, prevents rain reaching the plains to the north of the Dhofar Mountains and Arabia's central desert, the so-called Empty Quarter, or Rub al-Khali.

Even places with the highest average annual rainfall figures may experience lean years. At the Hajar Mountain town of Masafi, for example, 350 mm may fall in a 'wet' year, whereas as little as 30 mm may be recorded in a 'dry' year. As a rule of thumb, rainfall decreases westwards away from the mountains. Indeed, many inland localities in Abu Dhabi have had

no measurable rainfall for over three years (up to the end of 1999). Only through the regular formation of dew can vegetation and wildlife be sustained in such places.

Table 1. Mean monthly maximum temperature (Bateen airport, Abu Dhabi) and national mean monthly rainfall 1971/72–1988/89.

	J	F	M	A	M	J	J	A	S	O	N	D
ºC	24	25	29	33	38	39	40	40	39	35	30	26
mm	11	38	34	10	3	1	2	3	1	2	4	10

Source: *The National Atlas of the United Arab Emirates* (UAE University, 1993)

The UAE is an arid land, but is, nonetheless, one of contrasting landscapes. The principal habitats, botanical communities and landscape associations of the UAE are described comprehensively in Western (1989) and, for Abu Dhabi alone, in Roshier et al. (1996) and Boer (1999).

The topography of the country is characterized by rapid changes between the sand and gravel desert which dominates most of the south and west of the country and the solid geology of the Hajar Mountain chain. At the furthest points inland the high crescentic dune systems of the waterless Empty Quarter of Arabia are reached. A dune belt with *ghaf, Prosopis cineraria*, adjacent to an extensive *Acacia*-clad gravel plain savannah of varying width, abuts the western side of the Hajar Mountains, with the arid, jagged and shattered mountains themselves, and their many associated wadis, rising rapidly to more than 1300 m. Once over the watershed there is an equally steep descent to the coast of the Gulf of Oman, part of the Arabian Sea. The corresponding alluvial gravel plain on the East Coast is patchy and small, and widest in the south, but, for the most part, separates the mountains from the sea. There are few cliffs, except where faulting has occurred, but numerous sandy beaches and coves. The elevated Musandam peninsula extending to the Straits of Hormuz is Omani territory.

By contrast to the north and east of the country, the Arabian Gulf littoral of the UAE is an exemplary development of active coastal *sabkha* (salt flats), recognized as the largest and geomorphologically most interesting of their type in the world. It is 300 km long and of variable width, but extends continuously 20 km or more inland in places. Isolated *sabkha* outliers, otherwise surrounded by dune and gravel desert, also exist inland (particularly in Abu Dhabi), more so in the west of the Western Region than elsewhere. The largest such area, the Sabkha Matti, a broad braided palaeo-river course covering several hundred sq. km, extends south well into Saudi Arabian territory.

The Arabian Gulf coast is extremely shallow and gently shelving. The numerous inshore and nearshore barrier islands in existence are simply part of a formerly more extensive and once almost continuous coastline invaded and dissected by post-Quaternary shamallic (north-westerly) storms, and thereafter inundated by a sea-level rise. The present-day *sabkha* coast itself only started to form some 4000 years ago. Many coastal and inshore areas have been affected by reclamation, dredging or other development or usage, while a number of islands are entirely man-made. Other than for oil-related activities, much of such development has been for recreational purposes.

Mangrove is represented in the Arabian Gulf, its most northerly occurrence in the world, by a single species, *Avicennia marina*, and covers extensive areas, although not continuously.

It is known to have been more extensive both historically and in the recent past, the reduction in area generally accepted as having been due to clearance (primarily for charcoal, as fodder or other uses) as well as to natural die-back or disease. In the last ten years, however, extensive planting of mangrove has been undertaken, often with considerable success. Natural colonization itself appears to be relatively slow in most areas. Mangrove plays a vital role in the life-cycle of many commercially valuable seafood species and provides a safe nesting, feeding and roosting site for many birds, waterfowl in particular.

The larger offshore islands, such as Dalma, Sir Abu Nu'air, Sir Bani Yas, Qarnein and Zirku, are mostly the higher parts of a diapiric salt-dome surface, the clearest evidence for which occurs where the migrating salt has erupted through to the surface to form distinctive and obtrusive looking hills. Other islands can be anything from tiny sandy and shelly shoals to larger ones of raised coral and outcropping limestone with or without a covering of drift deposits. In some instances there are deposits of guano, created by colonies of an important *endemic* Arabian species, the Socotra cormorant, *Phalacrocorax nigrogularis*. Many islands hold internationally important numbers of breeding seabirds.

Three biogeographic realms are represented in Arabia: Palearctic, Indo-Malayan (Oriental) and Afrotropical. A Palearctic flora and fauna predominates over most of the peninsula, with the Indo-Malayan element restricted to eastern UAE and northern Oman (with a relic in Dhofar, Oman) and the third, Afro-tropical, to most of south-west Saudi Arabia, Yemen and southern Oman. These realms possess overlap zones, in terrestrial settings at least, and are therefore of special environmental interest and concern.

From a marine perspective the Arabian Sea is part of the western Indian Ocean faunal province, of which the Arabian Gulf represents a blind arm. The Arabian Gulf possesses a fair degree of endemism, primarily amongst invertebrate groups such as coelenterates, but taxonomic studies are continuing and even amongst vertebrate groups new species, of, for example, elasmobranchs (sharks), continue to be described. Coral cover is high in the Gulf and Straits of Hormuz and off the Batina coast of Oman, but declines southwards due to sandiness, turbidity, cold-water upwelling and increasing water depth.

The Arabian Sea and Arabian Gulf possess a variety of habitats: patch and fringing coral reefs, seagrass beds (Gulf only), islands, mangroves, *khors* (tidal inlets), extensive intertidal flats and saltmarsh and *sabkha*. The Arabian Gulf is a relatively young sea, post-Quaternary in date (resulting from the Holocene transgression), being the drowned estuary of the Tigris/Euphrates delta. It is shallow, for the most part less than 10 m deep in the western (Arabian) sector, with an average overall depth of 31 m and experiences a small tidal range (*ca*. 0.5–1.5 m in eastern Arabia). Mangroves, as stated earlier, reach here their northernmost point in the world (being limited by winter temperature), while corals are limited by summer temperatures. A heat-induced die-off of around 90 per cent of all coral in the southern Gulf has taken place since 1995. Water temperatures in the Gulf exceed 33°C in summer, falling in winter to 16°C in the north and 22–24°C in the south (Chiffings 1994). A complete turnover (change) of waters in the Arabian Gulf is estimated to take five to seven years.

The Gulf of Oman and Arabian Sea is deep and is influenced by the rest of the Indian Ocean. Upwellings of cold or cool nutrient-rich waters and consequent high levels of productivity are a noteworthy feature, primarily in southern areas, and are responsible for substantial fisheries. Beach seine-netting operations along the UAE East Coast are especially productive.

International environmental organizations recognize two priority *ecoregions* in the Gulf region. Such ecoregions, which can be many thousands of sq km in extent, have been identified globally on the basis of their unique biological diversity and biogeographical functioning (Olson and Dinerstein 1997). The two ecoregions represented in the UAE – the Arabian Gulf and Arabian Sea and the Arabian fog and highland woodlands (both described below) – are considered of sufficient ecological and socio-economic importance to warrant concerted action at governmental and inter-governmental level to maintain sustainable levels of resource exploitation. Although the desert rangelands are not expressly singled out in the same way, they arguably represent a third ecoregion, a Nubo-Sindian province (part of a much larger Saharo-Arabian or Eremic phytogeographic zone stretching across tropical Africa to south-west Asia). The socio-economic value of the desert environment is not neglected, and its landuse management rests as a national prerogative (see below).

The conservation value of the first-named ecoregion, the Arabian Sea and Arabian Gulf, centres primarily on its commercial fisheries, coral reef and mangrove communities (themselves fish nurseries), internationally important island seabird colonies and numbers of visiting shorebirds, nesting and feeding grounds of turtles, cetaceans (including both whales and dolphins) and dugong herds, amongst others. The Gulf coast is highly significant for migratory waterbirds, lying on the west Asian-African flyway for intercontinental migrant waterfowl. Both coastal mudflats and marine waters, supporting resources independent of political borders, are, therefore, of common international interest. Hornby (1997) provides a useful summary of the environmental sensitivity of coastal habitats of the UAE.

The second ecoregion is that of Arabian 'fog and highland woodlands and shrublands'. The south-east Arabian fog highlands, part of this ecoregion, reach to nearly 2000 m in the UAE and to nearly 3000 m in Oman, but are of restricted areal extent. The flora, of Nubo-Sindian affinity, is in part relict and unique both to and within Arabia and thus of high conservation value. At low altitude is *Acacia tortilis* savannah 'parkland'. This changes higher up to similarly arid *Euphorbia larica* shrubland, with, on broken ground approaching 1000 m, an *Olea sp.* (wild olive) community. The associated higher vertebrate fauna is impressive, including Arabian leopard, Arabian tahr and ibex, as described below.

The climatic regime is all important in maintaining these high elevation communities, with the formation of fog and dew being absolutely critical. In the Hajar Mountains of the UAE, dewpoint can be approached closely without the formation of condensation and the mountain environment is teetering on the edge between survival and oblivion. Human use of such areas is now limited primarily to livestock grazing, quarrying and small amounts of tourism.

The desert environments of the UAE also require description, since four-fifths of the country's land area is by definition desert. In Abu Dhabi, which represents around 80 per cent of the entire land area of the country, sandsheets, gravel desert and saline flats, each further subdivided, are recognized by Roshier et al. (1996) on the basis of their floral associations. To an untutored eye one piece of desert may look superficially similar to any other (not being helped by the ostensibly similar form of most xerophytic and halophytic vegetation), but this is far too simplistic an impression. The structure and function of even adjoining areas may differ appreciably from each other, as a result of, for example, varying soil characteristics, micro-climatic differences and grazing regime.

Although characterized by low ecological diversity and thus not always valued in the same way as a biologically more productive landscape, deserts are nonetheless of immense value to one primary industry – agriculture. Temporarily leaving aside desert greening and crop cultivation, itself sustained only by irrigation using supplies of desalinated seawater or non-replenishing fossil ground-water, traditional grazing by domestic animals (primarily camels, sheep and goats) is a major industry, producing meat, milk and related dairy products. Although in an altered format, with traditional nomadism essentially a thing of the past, the relatively static livestock herds (mostly tended by expatriate labour) are not regulated or subject to any formal control. Overgrazing is now widely accepted to be a major landuse issue.

Important Species Assemblages

i. Arabian Sea and Arabian Gulf ecoregion

Mangroves are vital nursery areas for commercially valuable fish and other species, and yet their incorporation in an integrated coastal zone management plan has still to be concluded. The areal loss of mangal woodland around the Indian Ocean, in its entirety, has been estimated at c. 50 per cent in the 20 years prior to 1985 (IUCN/UNEP 1985), this mostly resulting from human activity, although the picture in the UAE is different with a premium placed on mangrove conservation.

Reef fish populations have suffered from a natural die-off of corals in the Gulf during the last few years. Summer temperatures (and presumably a related rise in salinity) have exceeded that tolerable to corals which means the whole system is under stress. Any form of resource utilization needs therefore to be related to existing ecological limitations. The reefs of the Arabian Sea remain substantially intact, such losses as have been noted being from man-made causes.

Turtles in UAE waters are of international importance. Green turtle, *Chelonia mydas*, and hawksbill, *Eretmochelys imbricata*, nest on a limited number of islands, while important feeding and probably nursery areas, with high densities of non-breeding or immature animals, are known in the waters of both the Arabian Gulf and the Gulf of Oman. Loggerhead turtles, *Caretta caretta*, also occur, as do several species of seasnake (Brown 1987).

Thirteen *Important Bird Areas* (see glossary), have been identified in the UAE, almost all concerning island seabird colonies and intertidal feeding sites for shorebirds (Evans 1994). Among these only one internationally important intertidal wetland exists outside the Arabian Gulf, namely Khor Kalba on the UAE-Oman border. A *Directory of Wetlands in the Middle East* (Scott 1995) includes all of these sites, plus a few more recently identified significant areas. Using definitions derived from the *Ramsar Convention* (see glossary), the latter publication (being more habitat oriented) adopts criteria other than simply birds to assess whether sites are included. Many of the sites in Evans (1994) are merged here to form much larger units, thus amalgamating their overall values into cohesive, more readily ecologically sustainable blocks.

The Arabian Gulf is critical for internationally important numbers of long-distance migrant shorebirds and many sites would qualify as Ramsar sites. A minimum of 25 of over 100 species of regularly visiting waterfowl utilizing the West Asia-Arabia-Africa flyway (Scott 1995)

occur in regionally (internationally) important numbers in the UAE. In addition to these, there is the presence of internationally important breeding colonies of at least nine other species, all but one being seabirds (Aspinall 1996a) and all of which are national *Red Data species* (see glossary) (Hornby and Aspinall 1997).

Socotra cormorant, *Phalacrocorax nigrogularis*, is the sole regional endemic bird with only 14 known extant colonies worldwide, all but one or two of which are in the Gulf (though all fall within the single ecoregion). Some six or more of these colonies lie in UAE waters. Persecution is a problem, as is continuing development of islands supporting colonies. About 10 per cent of the world population of white-cheeked tern, *Sterna repressa*, breeds on the UAE's islands. An endemic race of white-collared kingfisher, *Halcyon (Todirhamphus) chloris kalbaensis*, is confined to the type locality, Khor Kalba, on the Gulf of Oman coast of the UAE and has a population of less than 50 pairs.

The continued survival of healthy populations of cetaceans and dugong are also dependent on a concerted international conservation effort. Large herds of dugong exist in UAE, Bahrain, Qatar and Saudi Arabian waters. The Gulf supports the second largest population of dugong, *Dugong dugon*, in the world, estimated in 1986 at 7310 plus or minus 1300 (Preen et al. 1989). A repeat survey of Abu Dhabi waters was completed in 1999 by the Commission for Environmental Research, part of the Emirates Heritage Club, Abu Dhabi, and found no statistically significant change in the number of dugong occupying Abu Dhabi waters, with an estimated 2000 to 3000 individuals present (Preen, pers.comm.).

Whales and dolphins have been studied to some degree in the Arabian Sea, primarily in Oman. There has been recent fieldwork in UAE waters too (Baldwin 1995), although much remains to be learnt about the population ecology and migrations of the country's cetaceans. Important populations of some species, for example Bryde's whale, *Balaenoptera edeni*, and humpback whale, *Megaptera novaeangliae*, certainly exist, and may do so for other species, for example the finless porpoise, *Neophoecaena phocaenoides* (Aspinall and Baldwin 1999). Some such species, being isolated, possess behavioural and genetic differences compared with their nearest conspecifics, something which warrants further research and conservation attention.

The UAE's Exclusive Economic Zone, reaching to 200 nautical miles off the East Coast, is known to house many whales, some of which may be resident. Fujairah, which alone of the seven emirates fronts the Gulf of Oman (Arabian Sea) coast, has already designated three marine reserves closed to fishing in order to protect coral reef communities. These may be extended to cover the important cetacean populations present further offshore. The Arabian Sea and Arabian Gulf are both part of the International Whaling Commission's (IWC) Indian Ocean Whale (Cetacean) Sanctuary dating back to 1979.

Since the UAE is of such major importance for wildlife, it is surprising that formal protected areas (nature reserves) in the UAE's marine and coastal environment are rather few. There have been popular calls for the designation of a number of sites (see Aspinall 1996b; Aspinall and Hellyer 1997) and the whole issue is currently under review at the level of individual emirates. The coverage afforded is planned to extend, moreover, to important palaeontological and geological sites, landscapes (geomorphological features) and to archaeological sites.

The *keystone* marine communities of the Arabian Sea and Arabian Gulf – those essential to the continued successful functioning of the system – are the coral reefs, seagrass beds, mangrove woodlands, intertidal flats and predator-free islands. *Flagship species* are those

which, for a variety of objective or subjective reasons, are singled out to promote survival of the community in which they occur. Those dependent on keystone habitats (e.g. seagrass, coral reef or mangroves) and which are suitably rare or endangered are hawksbill and green turtles, dugong, and the endemic Socotra cormorant.

ii. Arabian fog and highland woodlands and shrublands ecoregion

The biogeographically unique fog woodland ecotype occurring in south-east Arabia is, as described earlier, primarily of Palearctic origin. Occurring only in northern Oman and the UAE, its ecological importance centres on its rare mammals, particularly ungulates (e.g. Arabian tahr, *Hemitragus jayakari*, and ibex, *Capra ibex*, the latter if still extant) and felids (Arabian leopard, *Panthera pardus nimr*, especially, and Gordon's wildcat, *Felis sylvestris gordoni*).

The flora and fauna is an uneven mixture of Palearctic and Indo-Malayan (Oriental), the latter forming a minor component, and contains relict populations of some taxonomic groups. Of special interest is the little studied limestone cave fauna of Jebel Hafit, an outlying mountain block immediately south of the inland city of Al Ain, which may harbour species as yet undescribed by the scientific community. Mammals (Stuart and Stuart 1998, 1999), butterflies (Gillett 1996, 1997, 1998), dragonflies and damselflies (Giles 1998, Feulner 1999), freshwater fish (Feulner 1998) and freshwater snails (Feulner and Green 1999) of the mountains and wadis have all been documented to some degree, but most taxa await thorough scientific study.

The Arabian leopard certainly, and possibly the Arabian tahr, are the flagship species in this ecoregion. As yet, no formally protected areas exist in the mountainous regions of the UAE, although a number have been proposed (Jongbloed, pers. comm.).

There is unanimous agreement on which higher taxa in these two ecoregions are at greatest risk in terms of threat to their survival. Many are keystone communities (cf. coral communities, seagrass beds, mangrove etc) or have been identified as flagship species. In marine environments, dugong and marine turtles are pre-eminent, whilst in the mountains, population levels of the Arabian leopard and endemic Arabian tahr are critically low, although the former, with an estimated Arabian Peninsula population of around just 100 individuals, is usually singled out as the sole flagship. The similarly endemic Gordon's wildcat found only in the mountains of Oman and the UAE is little known, and suffers hybridization with feral cats.

At a community level, commercial fishes, particularly the grouper, *Epinephelus coioides* (*hamour)*, and sharks such as *Carcharinus* spp., are under threat from habitat degradation and overfishing, and the Gulf's commercial fisheries undoubtedly pose the threat of producing irreversible damage to commercial and non-commercial species alike, as well as to entire communities.

A gross data deficiency precludes assessment of the status of many other species and subspecies described from the region, particularly amongst lower taxa, but at a community level the longer term landuse issues and impacts are now well established. This applies in coastal and marine and mountain environments, as well as in desert areas as now described.

iii. Desert areas

As already stated, some four-fifths of the UAE land area is desert of one form or another. These terrestrial habitats and their geomorphological setting warrant brief description.

Sand desert is dominant, with high crescentic (mega-) dunes in the deep south of the emirate of Abu Dhabi, in the area known as the Liwa. A sandsheet of transverse and linear dunes with interdune plains occurs over most of the remaining such area west of the Hajar Mountains north to the Gulf coast of the northern emirates. Vegetation is sparse, dominated by the sedge, *Cyperus conglomeratus*, and various species of *Chenopodiaceae* (goosefoot family). A restricted belt of saxaul *Haloxylon persicum* shrubland exists some 20 km inland from the coast. The coast itself is characterized by halophytic scrub, again primarily involving goosefoots, with mangrove in mainly lagoonal settings.

Closer to the mountains is a zone supporting tall *'ghaf'*, *Prosopis cineraria*, trees. These are characteristically widely scattered, although occasionally clumped, in sandsheet terrain comprising low linear dunes. Nearer to the coast such sandsheets may be additionally cloaked with *Crotalaria*, *Calotropis procera* and other woody shrubs. Immediately adjacent to the western flank of the Hajar is an extensive gravel outwash plain of variable width. *Acacia tortilis* is dominant here, very often along with dogbane, *Rhazya stricta*, and the ecotype is one of savannah.

A number of general accounts exist of the mammal fauna of the UAE deserts (e.g. Duckworth 1996; Gross 1996; Harrison and Bates 1991). Hornby (1996b) provides a first 'Red Data' list which covers all UAE mammals. Arabian oryx, *Oryx leucoryx*, is extinct in the wild in the UAE, but individuals from the large captive herds (see below) will eventually be provided for a reintroduction programme. The size of the wild population of several species is now very small, particularly of sand gazelle, *Gazella subgutturosa* (considered critically endangered), and the Arabian or mountain gazelle, *Gazella gazella*. Rodents, excepting Cape hares, *Lepus capensis*, have been little studied, despite being numerically the most abundant of the desert mammals. Reptiles are perhaps no better known or documented (but see e.g. Brown 1984; Gross 1996; Hornby 1996a; Khan 1998), although reasonably thorough attention has been paid to birds (e.g. Aspinall 1996a; Osborne et al. 1996; Wardman et al. 1997).

Other lower taxa have been studied to varying degrees: e.g. insects (Gillett 1996, 1998); arthropods (excluding insects) (Tigar 1996); butterflies (Gillett 1997) and moths (Legrain and Wiltshire 1998).

Grazing management in desert areas is regulated by the graziers themselves, although many areas now show the characteristics of chronic overgrazing. The problem is not yet being addressed and now that the original socio-economic system has changed so radically, it is likely that rigid landuse management practices will eventually need to be introduced. In Abu Dhabi, seven sizable desert areas have recently been proposed by ERWDA as protected areas. Similar initiatives exist in Dubai and Sharjah emirates.

One further complexity, applicable in Abu Dhabi emirate, concerns the dissolution of nomadic practice. In part due to the establishment of political frontiers, the regular cross-country movement once enjoyed in and around the Empty Quarter has ceased to exist. Only within national borders is such movement now easily possible. The erection of fences also prevents wildlife moving freely, and such severance may, in disrupting necessary migratory movements, result in certain populations dwindling. The establishment of transfrontier reserves, primarily for ungulates (but valuable for the entire floral and faunal community), as have been mooted, may see a relaxation sufficient to allow wildlife to flourish.

As an adjunct, it should be mentioned that the ex-situ conservation (captive breeding) of rare breeds of ungulate (hoofed animal) and cats, is successfully in progress in UAE. A notable breakthrough has been recently achieved in breeding Arabian leopard and the notoriously difficult Arabian tahr, both, as already observed, highly endangered in their mountain retreats.

The success achieved with captive Arabian oryx since a few animals were taken from the last remaining wild herd at the instruction of UAE President, HH Sheikh Zayed, in the early 1960s has been remarkable. While once the species was on the brink of extinction, its future is now assured, although reintroduction programmes remain fraught with problems (none insurmountable). At the present time over one thousand individual oryx, comprising several separate herds, are held in UAE collections. Breeding loans of several different species are arranged with reputable overseas institutes and an international Secretariat, working on the conservation of Arabian oryx, is being established in Abu Dhabi under the aegis of Abu Dhabi's Environmental Research and Wildlife Development Agency (ERWDA).

Threats

Environmental protection relies on identification of threats to the integrity of the ecosystem involved, whether man-made or natural, thus permitting remedial or prescriptive action and appropriate long-term management. Threats to the Arabian Gulf and Arabian Sea mirror threats which occur on a global scale and include industrial and domestic pollution, eutrophication, reclamation, landfill and sedimentation, hunting, persecution, overfishing and unsustainable harvesting, alien introductions including predators on islands, disturbance, mismanagement and development. A lack of environmental impact assessment or study has permitted large scale and widespread loss of important habitats and indigenous wildlife resources. The introduction and enforcement of the most recent legislation should reduce or eliminate most of these threats.

Threats to the Arabian fog and highland woodland and shrubland communities are many. These include overgrazing, proliferation of invasive aliens, persecution and socio-economic changes, the latter apparent in the decline of traditional farming and landuse practices.

Most desert areas of the UAE are, as stated above, much degraded as a direct result of overgrazing, although mostly not beyond possible restoration. Large scale conversion of desert rangeland to irrigated grass and crop land has encroached considerably on the desert in the past 25 years, while the tradition of nomadism is now a thing of the past. Coupled with the unpredictability of the weather (a notable drought persisted in the UAE over the last three years of the old millennium), these factors have added to the problem of finite resources.

Mismanagement, often overlooked, is in fact an insidious and widespread threat to all ecosystems, but to coastal and desert areas in particular.

Agriculture

The main areas of agricultural development in the UAE are in Abu Dhabi, Ra's al-Khaimah and Sharjah. For many, UAE agriculture is inextricably associated with the production of dates. Indeed, the number of producing date palms has increased five-fold from under 5 million in 1986 to over 25 million in 1997 (Ministry of Agriculture and Fisheries statistics 1997).

This aside, there are now nearly 24,000 farms in operation throughout the country, 12,000 (50 per cent) of which have been established since 1993, and a wide diversity of crops are produced (Al Abed and Vine 1999, 2000). Presently, around 2000 sq. km of land is under the plough. Since the modernization of the industry as part of the process of economic diversification, traditional low-intensity but labour intensive farming practices survive only in some mountain districts, as the country strives for self-sufficiency in food production. The UAE is currently estimated to be 30 per cent self-sufficient in agricultural products. Surplus production of certain vegetables and fruits is now exported fresh, canned, dried, frozen or pickled.

Over ten million tonnes of agricultural produce is produced annually, with guaranteed prices assured by the Government to encourage the industry. Similar gains have been made in other sectors, including dairy produce, eggs, poultry and livestock. The number of camels (the meat of which is much prized) has more than doubled to around 200,000 animals in the last 20 years, while that of goats and sheep has increased four-fold to 800,000 in the same period. Production capacity of certain products, milk for example, approaches domestic demand, but as the human population continues to grow apace is likely to fall behind. Fodder production for the growing livestock industry similarly cannot match the demand and much has still to be imported.

Forestry plantations have become a widespread feature of the desert landscape. Afforestation, using a variety of native and exotic trees and shrubs, has transformed many areas of the desert. 'Green belts' and plots, some of considerable size, are often located to prevent sand movement smothering urban and rural developments. Such greening of the desert, as it is popularly described, serves the dual purpose of reducing airborne sand movement (drift) and of 'beautification' of towns and their outskirts. It does, however, require drip-fed irrigation to survive and uses significant quantities of water, some desalinated, but more of it increasingly drawn from recycled sources. The construction of dams, some 40 of which are now in existence in the mountains, may help reduce depletion of the aquifers at least in eastern regions. As a direct result of abstraction and lack of replenishment, the water table has dropped throughout the country, and at its most severe has allowed saltwater incursion to contaminate well-water supplies of some coastal communities.

Management of the natural woodlands of the UAE, including the Acacia savannahs (of, for example, the al-Madam and Kalba plains) and the zone of *ghaf* woodland or the saxaul belt, both in the sandsheets, as well as the zone within the Hajar Mountains is, however, still largely neglected. The Federal Environment Agency's (FEA) Biodiversity Committee has made a call for a concerted action in respect of these woodlands.

Commercial fisheries

According to recent statistics (1999), nearly 19,000 persons are employed as fishermen, some 15,000 (73 per cent) of whom are expatriates and 4000 nationals (27 per cent). Fish landings presently cover 100 per cent of domestic consumption.

Keen to protect the fishing industry, which in the UAE is second amongst the Arab Gulf Cooperation Council (AGCC) states in terms of the volume of its annual catch, the Ministry of Agriculture and Fisheries has introduced a suite of legal restraints (see Law No. 23 for 1999 below). The relevant new legislation requires any fishing boat going to sea to have an UAE national on board, although this is not always followed or enforced. The measure is as much to encourage nationals to take up the profession, as to prevent operators running small armadas

of vessels employing cheap labour which only serves to deplete fish stocks further. Fish may not now be caught during the spawning season and undersized fish must be returned to the sea, while trawling for shrimps has been banned since 1980 to safeguard spawning grounds.

Amongst management tools employed to some effect, artificial reefs have gained considerable favour. Although colonized by full-grown immigrant fish and vulnerable to abuse by fishermen, such reefs, quite apart from fostering coral growth, are now seen as a means of promoting ecotourism locally. Dubai and Fujairah are pioneering the process, which may lead to a shift in employment toward providing the range of services required by visitors.

Aquaculture is a growth industry with much potential. Plans to develop fish-farming have taken root under the offsets scheme, with a multi-million dirham public company, the International Fish Farming Company (Asmak), being incorporated in May 1999 (Al Abed and Vine 2000). The infrastructure will include hatcheries, cage-farms and shrimp ponds, and processing plants, with production targeted to approach an equivalent of 10 per cent of the present-day fish landings. Similar but smaller private initiatives also exist.

Institutional Framework

The institutional framework which exists in the UAE as a federation, as well as in each of the seven emirates, in relation to the environment is described below. As intimated in an earlier section, that institutional responsibility, still in its relative infancy, is in a process of evolution and development, and it is possible that changes will happen with such rapidity that some of the organizations described below may be overtaken by events even before this text appears in print.

Ruling families

Each emirate possesses a ruling family, whose head (or ruler) may make decrees which have the force of law. These occasionally concern environmental subjects such as the establishment of protected areas and the introduction of hunting bans in the relevant emirate.

Governmental bodies

Unless stated, the organizations listed below are governmental bodies. The responsibility allocated to the various bodies is described.

i. Federal Government

Federal Environment Agency (FEA)

The FEA is the federal governmental body charged with enforcement of environmental standards and pollution control as well as policy setting (see Federal Law No.(7) for 1993, below). The Minister of Health chairs the board of directors which oversees the agency's operation.

In 1998, the FEA, jointly with UNDP, published a draft National Environment Strategy and Environmental Action Plan which as yet remains of untested precision and efficacy. Federal Law No. (24) for 1999, concerning protection and development of the environment, as described later, was prepared by the FEA.

A national biodiversity committee set up under the aegis of the FEA (after the IUCN Riyadh Forum in 1995) is currently dormant.

ii. Ministry of Agriculture and Fisheries (includes Department of Fisheries)

The Ministry of Agriculture and Fisheries is occupied with both marine (see Law No. (23) for 1999 below) and terrestrial matters. Its fisheries department deals with coastal and marine commercial fisheries and aquacultural development, including a research programme into fishery stocks and recruitment. This Ministry houses the inspectorate for the Convention on International Trade in Endangered Species (CITES) in the UAE.

iii. Individual emirate agencies or other governmental bodies

Environmental Research and Wildlife Development Agency (ERWDA)

ERWDA is an Abu Dhabi government body with jurisdiction in Abu Dhabi but its services are on offer to other emirates. Terrestrial and marine research centres both operate under ERWDA along with a cross-sectoral Environmental Services Unit. The National Avian Research Centre, also part of ERWDA, with responsibility for all bird-related research, runs a captive-breeding facility and houses the Houbara Specialist Group of the Species Survival Commission of the World Conservation Union (IUCN).

Department of Environment and Protected Areas (DEPA), Sharjah

Active since 1998, DEPA runs the Desert Park (natural history museum) and Endangered Arabian Wildlife Centre, as well as having responsibility for designating nature reserves throughout the emirate, a process which has already commenced.

Department of Tourism and Commerce Marketing, Dubai

The remit of this body includes nature conservation and the establishment of protected areas in the emirate of Dubai.

In the other emirates, Ajman, Umm al-Qaiwain, Ra's al-Khaimah and Fujairah, environmental research and protection is developed to a much lesser extent, although Fujairah has designated marine reserves in the Gulf of Oman and is preparing a decree on cetacean conservation. Ra's al-Khaimah now possesses (since winter 1999/2000) an Environmental and Industrial Authority for regulation and enforcement of, for example, permissible levels of air pollution in the emirate related to local quarrying activities.

iv. Municipalities

All major towns, including the capitals of each emirate, possess a municipality or '*baladiya*', essentially the local council. Municipalities are responsible for a multitude of activities, which can include everything from pest-control and refuse collection to managing parks and gardens and running zoos. In Abu Dhabi, the Food and Environment Control Centre (FECC) is part of the municipality. The FECC deals primarily with issues of public health. Other emirates have departments within their respective municipalities performing a similar function.

v. Academic research institutes

Emirates University, Al Ain.

The former Centre for Desert and Marine Studies, part of the Emirates University, had an affiliation with the Department of Fisheries offices and research laboratories in Umm al-Qaiwain,

itself part of the Ministry (as above). Recent re-organization at the former institute has meant this relationship now has an unclear future.

vi. Non-environmental governmental bodies
Nationalized and other companies

The Abu Dhabi National Oil Company (ADNOC) and all companies in its group, are bound by rigid Health, Safety and Environment standards. ADNOC, furthermore, is a driving force in environmental matters (policy, legislation and practices) in Abu Dhabi. Other companies in the group, including, in particular, the Abu Dhabi Company for Onshore Oil Operations (ADCO), also show a high level of corporate environmental responsibility. ADNOC and ADCO between them operate in exploration and production concessions covering over 75 per cent of the land surface of the emirate of Abu Dhabi. Amongst many environmental initiatives, the ADNOC group is committed to reducing or eliminating waste emissions, including working toward zero operational flaring in the near future.

Other companies, many from overseas, support environmental initiatives through, for example, sponsorship of research or awareness projects or by conducting their business activities applying environmental regulations from their own country, even when more stringent of those of the UAE itself. Examples include oil companies such as BP Amoco and Shell. It should be noted that Environmental Impact Assessments (EIA) are mandatory across all sectors.

Non-governmental organizations (NGOs)

A number of NGOs working in the environment sector exist in the UAE. Only the principal ones are named here: Arabian Leopard Trust (ALT); Environment Friends Society (EFS); Emirates Environmental Group (EEG); Emirates Natural History Group (ENHG); Dubai Natural History Group (DNHG) and Al Ain Natural History Group (Al Ain NHG). The mandate of each, excepting the three natural history groups, varies. Some have a lobbying and educational and awareness role, others may conduct research and survey, although the distinction may not always be immediately apparent.

The Abu Dhabi-based ENHG is a non-governmental member of the World Conservation Union (IUCN), the only current such member, governmental or otherwise, in the country. Certain other organizations, Dubai Zoo for example, are currently planning to submit their applications for membership.

Other organizations

A number of other organizations and departments are involved in environmental matters, two of which are described here on account of their importance in terms of governmental connections and scale of operation. The Environment and Wildlife Management section (EWM) of the Private Department of the UAE President is responsible for managing wildlife collections and farming enterprises on land owned by Abu Dhabi's ruling Al Nahyan family. This includes the island of Sir Bani Yas which houses captive breeding facilities for endangered Arabian and other ungulates (Anon 1999; Vine 1999).

The Emirates Heritage Club (EHC), under the chairmanship of Deputy Prime Minister HH Sheikh Sultan bin Zayed Al Nahyan, houses the Commission of Environmental Research

(CER), based on the island of al-Sammaliah 12 km from Abu Dhabi. The Commission undertakes applied research, retaining a particular interest in the protection of coastal and marine resources. In 1999 it completed the first phase of a fieldwork programme that will lead to the production of an atlas on which a coastal and marine management plan for Abu Dhabi emirate will be based.

Institutional relations

The many alliances of the different institutes are to some extent covered or inferred above, as is the national or international status of individual organizations. Some relevant high-level institutional relations are expanded on below.

In the UAE, the FEA and United Nations Development Programme (UNDP), enjoy close relations, often in conjunction with the World Conservation Union (IUCN) and there is increasing liaison between the Ministries and agencies internally, as is the case between the FEA and ERWDA and the FEA and the Abu Dhabi municipality's Food and Environment Control Centre (FECC). There remains, however, much duplication of effort, to different standards. This relatively commonplace institutional and political hazard is, through a restructuring process, close to being resolved in certain sectors with a routine exchange of dialogue now evident.

Intergovernmental activity

The Arab Gulf Cooperation Council (AGCC), created in 1981, is an intergovernmental body which tackles issues of mutual economic, political and military interest to member states (see e.g. Anon 1998). The secretariat is based in Riyadh, Saudi Arabia and all Arabian countries bordering the Arabian Gulf are members, namely: Kuwait, Saudi Arabia, Bahrain, Qatar, UAE and Oman. The GCC may give its patronage and support to regional meetings dealing with common environmental issues.

The Council of Environmental Affairs Ministers convenes annual meetings of the relevant AGCC ministers. At the sixth and most recent such meeting, which took place in Doha in 1999, issues such as ozone depletion, hazardous chemicals and international agreements were on the agenda, as was an AGCC Regional Strategy for Protection of the Environment in implementation of Agenda 21 (see below).

The World Health Organization (WHO), United Nations Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP) and United Nations Development Programme (UNDP), all maintain a presence in the region, advising governments and organizations as named above.

The role of the United Nations Educational Scientific and Cultural Organization (UNESCO) and Arab League Educational, Scientific and Cultural Organization (ALESCO) includes environmental matters of mutual concern. UNESCO's Man and Biosphere Programme (MAB) is relevant to the region, operating alongside and in tandem with the activities of UNEP/UNDP and other organizations. The Regional Organization for the Protection of the Marine Environment (ROPME), with a secretariat in Kuwait, is part of UNEP's Regional Seas Programme.

Kuwait Action Plan

Under the Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution, the associated Kuwait Action Plan (KAP) is a regional initiative

for the Arabian Gulf (see MARPOL below). All AGCC countries are party to the convention which aims to reduce pollution, establish national standards and develop research and monitoring programmes relating to all types of pollution. KAP operates through ROPME, as well as with many national organizations and other institutions.

MARPOL
The Arabian Gulf and Gulf of Oman are declared Special Areas under Annex 1 and V of the MARPOL (Marine Pollution) treaty, Convention for Cooperation on the Protection of the Marine Environment from Pollution. This is as adopted by all AGCC countries, as well as Iraq and Iran, along with the Kuwait Action Plan (as above).

MEMAC/GAOCMAO
MEMAC, the Marine Emergency Mutual Aid Centre (run out of Bahrain), and the Gulf Area Oil Companies Mutual Aid Organization (GAOCMAO), are regional environmental management and pollution control initiatives, primarily linked to the oil industry.

UNESCO
Both the Man and Biosphere programme (MAB) and the World Heritage Convention operate under UNESCO. A World Heritage Site has been unofficially proposed for part of the Abu Dhabi coast and islands, UAE (see Aspinall and Hellyer 1997) and has recently been evaluated by an UNESCO team, although the UAE is not party to the relevant convention. The UAE has also yet to sign up to the MAB programme.

UNEP
UNEP's Regional Seas Programme includes within it the Kuwait Action Plan (above). Other UNEP initiatives include collaborative cross-sectoral alliances, for example, with the FEA.

Other national and international NGOs

IUCN
The World Conservation Union (IUCN) is also active in the region, independently and in collaborative efforts, for example with UNDP and the GCC, as well as, recently, with ERWDA.

A workshop on biological diversity in the Gulf Cooperation Countries was convened jointly by IUCN/GCC in Kuwait in September 1994 together with Kuwait's Environment Protection Council. In brief, the main purposes of this meeting were to review the implications of the Convention on Biological Diversity (CBD) for GCC countries and specify requirements for implementation; to assess the current status of biodiversity in member states and identify elements for inclusion in national strategies; to identify regional priorities, agree regional policies and to specify what support IUCN could give. Progress in these directions remains unclear.

At the IUCN North Africa/Middle East/West Asia regional conservation conference in Riyadh (Riyadh Conservation Forum) in October 1995, other than general sessions, three commissions convened. The Species Survival Commission (SSC) endorsed two objectives: the implementation of regional and national action plans that employ all appropriate conservation strategies and implementation of international conventions.

The then Commission for National Parks and Protected Areas (CNPPA) reviewed its draft strategic plan and discussed the draft regional action plan for North Africa and the Middle East. The Commission for Ecosystem Management (CEM), agreed on the assembly of task forces for integrated coastal zone and arid-lands management through seminars and the promotion of cross-sectoral collaboration. The Arabian Gulf has clearly to be a priority area for attention.

The IUCN West Asia, Central Asia and North Africa programme includes the Middle East. Recently, meetings have taken place to synthesize a project proposal towards 'An integrated protected areas strategy for biodiversity conservation in the Middle East'. This appears to be still on the drawing board. Training, protected area legislation, pilot protected areas, nature-based tourism and ecotourism are the four priority objectives proposed. IUCN operates closely with the GCC at a technical level.

The World Commission on Protected Areas (WCPA)
During 1998, the WCPA (formerly CNPPA) finalized a regional action plan for protected areas for North Africa and the Middle East. Funding is now being sought for its implementation (Sulayem, pers. comm.).

World Wide Fund for Nature
WWF-International anticipates establishing a permanent presence in the UAE capital in the near future. A memorandum of understanding has recently been signed with ERWDA, permitting WWF to operate independently, but in close association with UAE governmental and other non-governmental bodies.

BirdLife International
BirdLife International, which now has a Middle East office based in Jordan (as of 1997/98), first made inquiries about working in the UAE in the mid-1990s and may shortly establish some level of representation.

Wetlands International
Wetlands International, formerly the International Waterfowl Research Bureau (IWRB), completed an inventory of Middle Eastern freshwater and marine wetlands to 6 m below low water and published the findings as a directory (Scott 1995). The UAE was well represented. Wetlands International has no permanent presence in the country.

Environmental Legislation

Current legislation relevant to the natural environment and its resources is described below. Much has come into force only in the last decade, and the most recent, at least, has yet to be put to the test. The relevant organizational structure to institute, monitor or enforce such legislation is still in its infancy and individual roles and responsibilities may not yet be completely clarified.

UAE Hunting Law, Federal Law No. (9) for 1983

This, the earliest piece of federal legislation relevant to the environment, was issued nearly eight years after the creation of the first governmental environment body, the Higher Environmental Committee, although in 1976 a ban on hunting had been introduced by ruler's decree in Abu Dhabi. The 1983 law specifically regulated the hunting of birds and animals (mammals and reptiles) and was introduced on the basis of submissions by the Ministers of the Interior and of Agriculture and Fisheries. It was introduced in recognition of apparent declines being noticed in the populations of a number of desert and marine species. Regulations stipulated by Articles 1 and 2 are wholly unambiguous and read thus:

Article 1

Hunting, gathering or destruction of the eggs of wild and sea birds of various kinds including doves, orioles and small birds, with the exception of cormorants, are hereby banned in the UAE.

Article 2

It is not permitted to hunt the following animals:
1. Deer [antelope*] *of various kinds* [i.e. gazelle, oryx]
2. Wild cows ['seacows' or dugong]
3. Hares
4. Mastigures ['dhubs' or spiny-tailed agamids (lizards)]

*Note that square brackets are used where the translated animal names are given their common English names.

Article 3 details punishments that may be handed down, including imprisonment for a period of up to six months and confiscation of transport and tools used in committing an offence, while Article 4 revokes any prior provisions 'inconsistent' with those included in Articles 1, 2 and 3.

Since the UAE Hunting Law was introduced, the Ministry of Agriculture and Fisheries brought a successful case for a similar decree affording full protection to marine turtles and their eggs (see Law No. (23) for 1999). Implementation and enforcement of this legal protection, for birds and turtles in particular, remains a somewhat contentious and even openly challenged issue.

In addition to the above law, some individual emirates have introduced their own legislation relating to hunting or wildlife protection. The Ra's al-Khaimah government, for example, issued a decree in August 1998 banning the hunting of birds and hares, despite the existence of the 1983 Federal Hunting Law.

Legislation may even involve single species. A complete ban on the importation of houbara bustard, *Chlamydotis undulata macqueeni*, a species of particular significance to Arab falconers, was brought into effect by Cabinet Resolution in November 1993. Such a ban is pertinent to the Convention on International Trade in Endangered Species (CITES), to which the UAE is party, which bans any form of trade of species as listed on Appendix One of the convention, as the houbara bustard then was.

The Higher Environment Council, the first governmental body with any environmental protection mandate, was created in 1975 (Banoubi, pers. comm.). It was replaced by the Federal

Environment Authority (FEA) in March 1993. The latter became strictly the first UAE-wide institution with legal powers to protect and conserve the environment. Now overseen by the Minister of Health, in contrast to the earlier legislation concerning environmental matters which fell to the Minister of Agriculture and Fisheries, the FEA is itself entrusted to a board of directors, chaired by the Minister.

Federal Law No. (7) of 1993 for the establishment of the Federal Environment Agency

The FEA, established by Federal Law No. 7 of 1993, enjoys financial and administrative authority annexed to the Cabinet, with an independent budget attached to the state budget. Article 4 of the decree outlines the aims and objectives of the FEA and is reproduced below (translation compiled from two referenced sources, Anon 1993b and Anon 1993c):

Article 4

The objectives for establishing the Agency shall be: to protect and develop the environment within the State; to determine the necessary plans and policies to safeguard it from damaging activities, particularly those affecting human health, agricultural crops, wildlife, marine life, other natural resources and atmosphere; to implement such plans and policies; to take all suitable measures and actions to prevent deterioration of the environment, to combat environmental pollution of all kinds, and to minimize effects of pollution for the welfare of both present and future generations.

In order to achieve its aims and objectives, the Agency shall cooperate and coordinate action with concerned bodies to:–

i. Prepare draft laws, legislation and regulations to ensure environmental safety, protection and development.

ii. Conduct research and studies and propose plans and general policies for environmental issues at the State level.

iii. Study and discuss plans and policies set by Ministries, agencies, institutions or companies practising activities that might affect the quality of the surrounding environment. Propose solutions to any environmental problems or obstacles impeding these programmes and projects.

iv. Examine, study, make necessary proposals and suggest suitable solutions for any environmental problems or matters that might be referred to the Agency by the Cabinet or any other official or non-official body within the State.

v. Conduct or supervise the conducting of extensive research and studies on pollution, monitoring its negative effects on health and environment, and take all necessary preventive measures and actions to minimize environmental pollution in all its forms.

vi. Establish the necessary basis and principles for incorporating environmental considerations into the process of planning and development in the State, by ensuring that environmental considerations become an integral part of policy-making, and by ensuring that environmental matters become part of planning, execution and follow-up of development projects initiated by Government or the private sector, applying the measures of environmental impact assessment.

vii. Monitor all public and private development activities that might have an adverse effect on the environment and has firstly to give approval to such developmental

activities before licensing them. Before approval, such projects shall be subject to Cabinet resolutions.

viii. *Collect and implement effective studies on air, water, sea, and soil pollution and devise ways of protecting the resources of the natural environment.*

ix. *Take an interest in the development of wildlife and protected areas* (nature reserves).

x. *Carry out studies on the nature of soil, water and energy and propose means by which they can be protected, and prepare guidelines to prevent the misuse or exhaustion of these resources, with a special focus on groundwater, desert areas and combating desertification.*

xi. *Carry out studies on the nature of the coastal zone and the marine environment and draw policies for protection, conservation and development of their resources.*

xii. *Determine and develop preventive measures to limit marine pollution, develop and train human resources and specialized personnel for implementation of schemes for the protection of the coastal zone* (from pollution).

xiii. *Establish a central environmental laboratory with the appropriate technical staff and equipment.*

xiv. *Specify permissible limits and carry out monitoring programmes for measuring radioactivity in water, air, soil and food.*

xv. *Endeavour to develop interest in education, information* (media), *sociological and cultural aspects with a view to increasing environmental awareness and promoting active public participation in protection and development of the environment.*

xvi. *Draw up and implement plans and programmes for the training of technical personnel in the field of environment.*

xvii. *Specify suitable methods for forecasting, anticipating and mitigating natural disasters.*

xviii. *Undertake a comprehensive review of problems of human settlement in cities, villages and rural areas. Follow up the effects of economic and social development on proposals for human settlement programmes, providing suitable solutions particularly for:*

   a) *Achieving an ideal distribution of human settlements in cities and rural areas.*
   b) *Ensuring the use of environmentally sound technology in design and construction of buildings.*
   c) *Ensuring the most suitable living conditions for town and village planning.*
   d) *Reduction of noise and air pollution through use of suitable means of transportation.*

xix. *Establish appropriate database systems for collecting, storing and exchanging information with research institutions and environmental organizations and making use of these regardless of whether they are inside the State or elsewhere.*

Federal Law No. (24) for 1999 for Protection and Development of the Environment

This is the most recent piece of federal environmental legislation, following hot on the heels of decrees establishing independent agency-level bodies such as ERWDA in Abu Dhabi and DEPA in Sharjah, empowered to undertake research and provide conservation advice. It came into force on 1 February 2000. Drafted by the FEA, this law, which carries 101 articles, is particularly strong in respect of the marine environment, with over 40 articles concerning

marine transportation and pollution and the respective penalties applicable to a vessel found in breach of any specified offence. Note that Federal Law No. (23) for 1999, which came into effect in mid-April 2000, after Law No. (24), also concerns, but exclusively so, the marine environment.

Article 2 of Federal Law No. (24) for 1999 for Protection and Development of the Environment outlines the objectives and general principles concerned:

1. *Protect the environment; preserve its diversity and natural equilibrium.*
2. *Fight all forms of pollution and avoid harmful immediate or long-term adverse effects resulting from planning for economical, agricultural or industrial or constructional development or any development programs aiming to upgrade the standard of living; Agency co-ordination with other concerned authorities and departments in order to preserve the environment, its diversity and the natural equilibrium, and consolidate concepts of environmental awareness and principles of pollution prevention.*
3. *Develop natural resources and preserve the various living species in the UAE and utilize them in an optimal way for the benefit of present and future generations.*
4. *Protect society, the health of human beings and other living creatures from any activities or acts which comprise a risk to the environment or which may impede the lawful use of the environmental milieu.*
5. *Protect the UAE environment from the adverse impact created by external activities.*
6. *Undertake the implementation of international and regional conventions ratified or signed by the State in respect of environment protection, pollution prevention and preservation of natural resources.*

Chapter 1, covering Development and Environment (Articles 3 to 16), introduces four sections: Environmental Impact (Section 1); Environment and Sustainable Development (Section 2); Environmental Monitoring (Section 3) and Plans for Emergencies and for Dealing with Environmental Disasters (Section 4).

Chapter 2 (Articles 17 to 41) covers the Protection of Water Environments from pollution in both marine and freshwater environments, including potable ground water, while Chapters 3, 4 and 5 deal with Protection of Soil, Protection of Air and Handling of Hazardous Substances and Wastes. Chapter 6 (Articles 63–68) defines the legal requirement for determining the location and boundary of nature reserves in the state.

Liabilities and compensation for environmental damages, Chapter 7 (Articles 71–72) and penalties, Chapter 8 (Articles 73–90), are explicit and apply, all importantly, both within and outwith the marine jurisdiction of the UAE, regardless of the nationality of any guilty party concerned. The penalties, involving fines and custodial sentence, extend, in the case of nuclear waste, to the possible imposition of the death penalty.

While the Federal Environmental Agency may be the ultimate authority in respect of the above law, the 'competent authorities' in each emirate will be responsible for activating its provisions.

In Abu Dhabi one such 'competent authority' would be the agency ERWDA, which itself carries a mandate (Law No. (4) for 1996 as amended by Law No. (1) for 1997) to:

> *. . . protect the natural environment, its wildlife and its biological diversity through monitoring and submitting of proposals and recommendations and by carrying out studies and research required for the protection of the environment and its wildlife.*

Moreover, all Abu Dhabi government departments and agencies:

. . . are required to coordinate with the Agency [ERWDA] in relation to research, studies and programmes concerning environmental matters and wildlife.

Furthermore:

. . . The Agency's approval is required for the issuing of any regulations, policies and decrees related to environmental and wildlife affairs.

Together with a role to evaluate the use of agricultural chemicals, the effect of industrial projects, assess the impact of town planning amongst many others stated objectives, there is, in this particular instance, a complimentary but at least partially overlapping role between the Abu Dhabi agency and the federal body ultimately responsible for matters relating to the environment. It remains to be seen what relationship is developed here, as well as between those competent authorities as exist in emirates other than Abu Dhabi in relation to the above law and to the FEA.

Federal Law No. (23) for 1999 for Protection of the Marine Environment (see Anon 1999b)

UAE legislation covering the protection of the marine environment, Law No. (23) for 1999, as proposed by the Ministry of Agriculture and Fisheries, came into force on 17 April 2000. Compliance with the requirements of the new law allows for a transition period of one year (unless extended by Cabinet Resolution). Federal Law No. (23) governs the exploitation, protection and development of marine biological resources. Fishing, protection of restricted areas, processing and marketing of fish, the extension of grants and loans to fishermen and the export, re-export and transit of fish products are all covered. The new law sets forth procedures for registration of vessels (expressly limiting their number) and of fishermen and for licensing of their activities. Catch limits are to be set by the Ministry of Agriculture and Fisheries. There is provision to regulate minimum animal sizes caught, introduce close seasons and restriction of fishing activity in certain areas. Fishing methods are also considered, with bans on the use of certain equipment or particular methods – nylon nets, drift nets, bottom-trawling and the use of narcotics and explosives, for example. The construction of artificial reefs requires Ministry approval as well as that of the concerned authority in the specific emirate, while even fishfarms require permission to operate.

Concern at the number of vessels engaged in fishing (employing solely expatriate labour) has meant that an earlier restriction specifying that fishing boats are not allowed to sail without the owner or his national representative on board has been reiterated in the marine law. Nationals from any AGCC country are also accepted. Foreign vessels are not permitted to fish in UAE waters at any time.

Penalties for breach of any of the articles in law No. (23) include fines and/or imprisonment and confiscation of boats and fishing tools. Thus the catching of turtles or dugong will meet with a fine of between Dh 50,000 and Dh 100,000 (US $13,500–$27,000) and/or six months in prison, with a second offence attracting a minimum of three years in prison and a fine of Dh 100,000–Dh 200,000. Fishing in the close season or using forbidden methods will bring three months in prison and/or a Dh 25,000–Dh 50,000 fine while a second offence incurs a minimum one year in prison and a Dh 50,000–Dh 100,000 fine.

Some elements of earlier environment-related legislation are absorbed and reiterated and there is necessarily some overlap with Law No. (24) for 1999 (above), capture of dugong or turtles and collection of the eggs of the latter again being prohibited, for example, although the relevant applicable penalties are absent from the Federal Environment law (No. (24) for 1999).

What should be noted from the above text is that the legislation establishing and empowering the various bodies, whether federal or agencies at an emirate level, provides a mandate for them to draft and introduce new laws concerning environmental protection. This necessary process has already proved itself to be dynamic and further legislation is planned.

Other environmental legislation

Strict laws exist on pesticides. The import of many chemical insecticides is explicitly banned, prudently leaving permissible only those already licensed for use in agriculture by the EU, US, Canada and Japan, for example. Regulations are also under discussion to phase out leaded fuel.

Conventions and intergovernmental activity

To date the UAE Government has signed all, but has yet to ratify most, of the following wildlife and environment related conventions:

- Climate Change Convention.
- Convention on Biological Diversity (CBD).
- Convention on International Trade in Endangered Species of Flora and Fauna (CITES) (Ratified).
- United Nations Convention to Combat Desertification (UNCCD).
- Convention for Cooperation on the Protection of the Environment from Marine Pollution (see under MARPOL and Kuwait Action Plan, above). Also signed by all other GCC States bordering the Arabian Gulf.
- The Law of the Sea (UNCLOS). In the immediate region this has been ratified by Iraq, Kuwait, Bahrain and Oman and, as with the UAE, is also signed by Iran, Saudi Arabia, Qatar and Pakistan.

Eventual ratification of other of the above conventions, as well as the Bonn Convention (Convention on Migratory Species, CMS), the Ramsar Convention (Convention on Wetlands of International Importance especially as Waterfowl Habitat) and the Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) is currently under consideration.

Environmental Education and Awareness

The UAE celebrated its first National Environment Day on 4 February 1998, the fifth anniversary of the inception of the Federal Environment Agency itself. This annual event is celebrated amid much publicity, with many events held on the day itself and thereafter in the following days and weeks.

While much of the grass-roots effort to increase awareness is undertaken by such governmental agencies as ERWDA, a great deal of it is taken on by (non-profitmaking) non-governmental

bodies, such as the Environment Friends Society (EFS), the Emirates Environment Group (EEG) and the Arabian Leopard Trust (ALT) amongst others, or by enlightened school teachers devising their own extra-curricular programmes. An attentive press, in both English and Arabic, although perhaps more so the former, ensures more than adequate coverage of domestic and global environmental issues and events.

Several conferences on environmental or related issues are convened annually in the UAE, mostly in Abu Dhabi and Dubai. Often receiving high-level support and patronage, the range of subjects tackled in recent years has included desertification, protected areas, coastal zone management, conservation of Arabian oryx, and industry and environment.

Two of the most recent such meetings, both held in early 2000, were the 'Dubai International Conference on Desertification 2000', organized by the secretariat of the Zayed International Prize for the Environment in cooperation with UNDP and United Nations Convention to Combat Desertification (UNCCD), under the patronage of the UAE Defence Minister and Crown Prince of Dubai, General HH Sheikh Mohammed bin Rashid Al Maktoum and the '1st International Symposium and Workshop on Arid Zone Environments: Research and Management Options for Protected Areas', hosted by ERWDA under the patronage of the Deputy Chairman of the Agency itself, Minister of State for Foreign Affairs HH Sheikh Hamdan bin Zayed Al Nahyan.

A non-governmental initiative, under the private patronage of Deputy Prime Minister HH Sheikh Sultan bin Zayed Al Nahyan, Chairman of the Emirates Heritage Club and its associated commissions, was the '2nd Arab Envirotech Conference' held in Abu Dhabi in April 2000. This meet, which focused on protection of the UAE's marine and coastal zone (following up on the recommendations after survey and critical investigation by a multi-disciplinary team of international experts), demonstrated how, by bringing relevant environmental issues into sharp focus, not only governmental bodies may exert political influence.

A major conference, entitled the 'Environment 2001 Conference and Exhibition', took place in Abu Dhabi in February 2001, co-sponsored by the UAE Government, UNEP, UNDP and other international bodies.

Although the four conferences above have received specific mention, it would be unjust to suggest they are necessarily more important than many other similar events that have either already concluded or are due to take place. Conferences and symposia are seemingly perceived as an important socio-political exercise, and a quintessential part of the process without which further progress would not take place.

Conclusion

The UAE is a small rich country that has developed extremely rapidly. What the future may hold is not easy to judge. On the one hand there is a desire and the wherewithal to continue to develop the country, and on the other there are delicate life-sustaining ecosystems requiring careful custodianship. There will be losses, that much is sure, but the UAE has taken up the challenge with creditable foresight. The institutional structure, supported by clear legislation, is now in existence, even if further legislation is still required. However, the plethora of bodies working toward a common goal often duplicate each others' efforts. Coordination and cooperation would pave the way for greater collective achievement.

Environment and development are important to the people of the UAE, with a certain pragmatism existing about the whole issue. Dialogue and solution-finding rather than conflict and the risk of defeat are the norm, nonetheless compromises sometimes have to be found and accepted. A guarantee exists, however, that simple financial aspirations alone will not be allowed to destroy the fragile ecological balance.

Commenting on the award to him in 1999 of the *Gold Panda*, the WorldWide Fund for Nature's most coveted award, for services to the environment, UAE President, HH Sheikh Zayed bin Sultan Al Nahyan, has the final word:

> *'With God's will, . . . we shall continue to work to protect our environment and our wildlife, as did our forefathers before us. It is a duty – and, if we fail, our children, rightly, will reproach us for squandering an essential part of their inheritance and of our heritage.'*
>
> Extract from Sheikh Zayed's speech on the occasion of the UAE's first Environment Day, 4 February 1998.

Glossary

ecoregion: a biologically distinct biogeographical realm, based on the total number of species present, level of endemism and presence of unusual ecological or evolutionary phenomena. Ecoregions are the target adopted by *WWF-International* for the conservation of global biological diversity.

endemic: referring to a species or subspecies found only in a limited geographical area, generally a country, socio-political unit or, more properly, a biogeographical region.

flagship species: a species so-called due generally to its popular appearance or appeal, for whatever reason, and thus used to 'market' its own conservation, as well as, most often, that of other species sharing a similar environment.

Important Bird Area: an area of land or water the loss of which would jeopardize the survival of a particular bird species or assemblage of bird species, whether globally or regionally, and whether breeding, migrant or casual visitor.

keystone community: a plant and/or animal community, survival of which is vital to and underpins the survival of the overall ecosystem as a whole.

Ramsar Convention: the original name for the Convention of Wetlands of International Importance Especially as Waterfowl Habitat, drawn up at Ramsar, Iran in 1971. The UAE is not yet a signatory. Criteria used to select 'Ramsar sites' are a). those regularly supporting 20,000 or more waterfowl; or b). those supporting substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity; or c). where the site regularly supports one per cent or more of the individuals in a population of one species or subspecies of waterfowl.

Red Data species: in no particular order of importance: a). an endemic subspecies confined to the UAE; b). any species that is adjudged to be regionally or globally threatened or near-threatened; c). any species with a national breeding population greater than one per cent of the biogeographical breeding population; or having an unfavourable conservation status; d). a species of 'restricted range' (<50,000 sq. km) living in a threatened habitat or habitat at risk from adverse man-made changes and e). any other native species with an estimated national breeding population of less than 50 pairs (excluding sporadic breeders and recent colonists) and considered to be under threat or known to be declining in numbers.

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Poetry in the UAE

Shihab M. Ghanem

Introduction

Although the Arabs have known other forms of art such as calligraphy, arabesque, architecture and music, poetry has always occupied the first position in Arabic art since pre-Islamic days. Only in post-Second World War times did new art forms such as novels, short stories, songs and above all, the cinema and television, begin to dethrone poetry. It is worth remembering that in pre-Islamic days, the Arabs hung their greatest poems or odes on the walls of their holiest shrine, the *Ka'aba* in Mecca, perhaps in the same way that we hang painting masterpieces in museums today. Those poems known as the seven (or ten) *Muallaqat* (i.e. hung ones) are still read and cherished today even by schoolchildren despite their use of archaic words. It is, therefore, ironic that the first Arab to be awarded the Nobel Prize for Literature was not a poet but a novelist, Neguib Mahfouz. However, the art of story-telling was also known to the Arabs since the Abbasid era in the form of the fables of Ibn Al Muqafa, and later in the *Maqamat* of Al Hamadani and Al Hariri and in the magical stories of a 'Thousand and One Nights'.

The late nineteenth century and early twentieth century saw the revival of poetry and the appearance of several outstanding poets including the Egyptian Ahmed Shawqi (1868–1932), possibly the greatest Arab poet since Al Mutanabi, who lived a thousand years earlier. The poems of Shawqi were often published on the front pages of newspapers, and newspaper boys would try to attract the attention of buyers by calling out that there was a new poem by Shawqi in the paper. Shawqi was elected by major poets from all over the Arab World as the 'Emir of Poets', but the Nobel Prize eluded him.

The Evolution of Modern Arabic Poetry

Arabic poetry since pre-Islamic times until the middle of the twentieth century followed the sixteen meters formulated by the eighth century Gulf Arab scholar, Al Khalil bin Ahmed, (one of these sixteen meters was actually added by his student, Al Akhfash). Slightly modified forms were added in the shape of *Al Muwashahat* during the period of the Islamic civilization in Andalusia in Spain. The line or *bait* adhered to the two hemistitches form, each with an equal number of feet, all the second hemistitches ending in the same rhyming letter and sound throughout the poem. The subjects of poems were usually panegyric, satire, self-praise, elegy, ghazal, (i.e. amatory or love poems), description or gnomic verse.

Contact with the West in the earlier part of this century led to the development of the *Mahjar* (or immigrant) school led by Lebanese writers like Jibran Khalil Jibran, Abu Madhi and Mikhail Nuaima, and the anti-Classical (and anti-Shawqi) *Diwan* school led by the Egyptian Al Aqqad. The romantic 'Apollo' school was led by poets such as the Egyptians Abu Shadi and Ali Mahmoud Taha, and the Tunisian Al Shabi. However, all these schools adhered to the *bait* form. In their poetry panegyric, self-praise and gnomic verse became rare and satire was usually political. Meditative, humanistic, nationalistic and love themes were common.

Just after the Second World War the Iraqi poets Al Sayyab and his compatriot poetess Nazek Al Malaikah popularized the modern *tafila* form, in which the same foot is used throughout the poem, but the number of feet changes from line to line with irregular rhyming. Earlier attempts using this form had been made by Ali Ahmed Bakatheer and a few other poets. The form soon became popular, especially with such socio-realist poets as Abdul Saboor and Higazi after the 1952 Egyptian revolution and among Western-influenced poets in Lebanon such as Hawi and Adonis. In their wake came the *tafila* Palestinian Resistance poets like Mahmood Darwish and Samih Al Qasim. At the same time, prose poems began to appear, first in Lebanon and Syria and later in other parts of the Arab world; these still face strong opposition from those who cannot accept that it is possible to strip Arabic poetry, after 15 centuries, of its rhythm.

Nabati Poetry in the UAE

It is difficult to find records of verse written in Classical Arabic (i.e. standard Arabic) by poets who lived in the area known now as the United Arab Emirates earlier than this century. One of the exceptions is the *argozas* of Ibn Majid, the great fifteenth century navigator. However, some good early *nabati* poetry was written in the vernacular style and the best known of the earlier poets is Ibn Daher who lived in Ra's al-Khaimah in the seventeenth century. One could find many maxims and words of wisdom in his poetry such as:

If incomes are obtained by strength and not Allah's will,
Then no lion would ever starve whilst dogs are full.

In another poem he says about old age:

You cannot prevent Allah's will to make us old
But perhaps He will reward us for enduring old age.

Nabati poetry is still very popular in the UAE, especially since it is written by many of the rulers and sheikhs, including President HH Sheikh Zayed bin Sultan Al Nahyan and HH General Sheikh Mohammed bin Rashid, Crown Prince of Dubai and Minister of Defence. Sheikh Mohammed is versatile, writing about various subjects including love. In one of his poems he expresses some of his philosophy of life:

The dark nights and hard days
We take them as they come and worry not about the future.
We walk along an unbeaten track
And if the path is difficult I enjoy it more.

One of his political poems entitled 'My Hopes', is dedicated to HH Sheikh Zayed:

O! You, our brothers of Kuwait and Euphrates.
O! You, our brothers, north and south in the Arab world.
Zayed has called out to us with dedicated resolve
A call whose commitment rekindles true hearts.
Listen to Zayed! Abandon sleep!
He has called us to denounce division.
He who follows Zayed may hope to survive.
Following Zayed is a duty – a vital duty.

Other well-known *nabati* poets include Al Khader, bin Yaqoot and Hamad Khalifah Bu Shihab who is also a well-known poet in Classical Arabic. In fact, *nabati* poets are numerous and almost every newspaper and magazine now has a weekly page for *nabati* poems. The subjects are usually love, meditation or praise for the leaders. Often the poems end with a prayer to Allah to bless the Prophet (peace be upon him). Occasionally, as with some of Rubaia bin Yaqoot's work, the poem is a criticism of modern social trends. Here,Yaqoot laments the change in traditions and some of the effects of modern schooling on girls and boys:

They have taught her dancing and singing
And made the girl an artist.
They trained her to perform gymnastics like an imp.
And the boy when he walks sways
His hair down to his collar,
Addicted to alcohol,
Sleeping with the bottle in his lap.

Classical Arabic Poetry in the UAE

Among the first Classical Arabic UAE poets to gain importance in this part of the world during the twentieth century were Mubarak Al Oqaili (1880–1954), Salem bin Ali Al Owais (1887–1959) and Ahmed bin Sulayem (1905?–1976).

Al Oqaili immigrated to Dubai from al-Ahsa in Saudi Arabia in his youth. He wrote in the fashion of the old classical poets and his ideas were nationalistic and anti-colonialist. Warnings by the British rulers silenced him only briefly, but he escaped imprisonment because of his blindness.

Salem bin Ali Al Owais was born in al-Hirah, a village between Sharjah and Ajman. He obtained a basic education and loved reading Arabic books and the few magazines and books that reached him or his friends from overseas. He was influenced by old classical poetry and early twentieth century poets like Shawqi and Hafedh of Egypt. His poetry was often nationalistic and he wrote several poems about the Palestinian saga. He was a great admirer of Egypt's President Nasser about whose deeds he wrote many poems, including one on the union between Egypt and Syria that took place one year before the death of the poet. He wrote of the ill-treatment of the poor divers by pearl merchants and warned the merchants of Allah's wrath.

Ahmed bin Sulayem had to emigrate to India because of his nationalistic views, but in 1948 was summoned back by Sheikh Rashid bin Saeed Al Maktoum who appointed him to a senior government post in Dubai. Bin Sulayem had strong connections with Oman and many of his poems were about Oman or were addressed to Omani poets and friends.

Three other poets of importance in the UAE were Khalfan Musabah (1923–1946), Sheikh Saqr Al Qasimi (1925–1993), an ex-ruler of Sharjah, and Sultan bin Ali Al Owais (1925–2000). The three poets, known as the Hirah group, grew up in the village of al-Hira in Sharjah and were close friends. Khalfan Musabah was influenced by the Apollo and romantic poets. He suffered a serious accident whilst working on a ship and died after prolonged unsuccessful treatment at the age of 23. In one of the poems he writes about his 'medical treatment' with a branding iron:

'I want to cure you
And cure may come with the burn of flesh.
Do not make the slightest move and be forbearing –
For endurance is the hallmark of courageous men'
Allah is the greatest! Oh! When he arose and rolled up his sleeve –
Like the son of Zabibah, walking towards the fire,
And fetched his huge branding iron
Its colour like the tongue of a vulture! –
He forced me down upon my knees,
His rock-like hand clutching the ball of fire.
Alas! For my poor body when it felt that searing iron
As it was stamped, embedded, held there.
I thought of the fearful fires of Hell
As I dropped delirious, like a ball of tar.

Sheikh Saqr Al Qasimi was ruler of Sharjah between 1950 and 1964 but was then deposed and went into exile. He was, however, allowed to spend the last years of his life in Abu Dhabi. During his exile Sheikh Saqr lived in Cairo and his poetry was published in Egyptian and other Arab magazines. He published a few books of verse and many of his poems were nationalistic. His poetry is written in the classical style, but his daughter Sheikha Maisoon writes poetry and also paints in very modernistic styles. In one of his poems he says:

They ask me: 'Wherefore is your poetry so always sad
When you are the son of a ruling prince?
Is this due to failure at love?
Or has the arrow of misery pierced you like well-aimed doom?'
I reply: 'Love? Do I cherish a love other than that for my country
In the face of the darkening catastrophes of tomorrow?

Sultan Al Owais was one of the best known UAE poets and he established the well-known Al Owais cultural prizes which are open to all Arabs. Most of his poetry is about love and tends towards the physical description of the female form and its beauty. He was perhaps influenced by the Andalusian poets and to some extent by the Apollo and modern *baiti* poets. A book of his poetry has been published and many of his poems have been published in English translation. An extract from his poem 'Rio de Janeiro' says:

Ah! For a gracefully shaped nymph
As though God ordained: Be beauty itself!
And she became beautiful beyond description.
She asked me: Are you in love?
I replied: Love is my resort,
For it I sing, and in it I seek refuge.
And she approached
With a swinging gait

Another poet of importance is Dr Ahmed Al Madani who was born in Dubai in 1931 and died in 1995. He was highly educated and studied in Baghdad, Cambridge and the Sorbonne. He published a few books of verse as well as a book about the development of *nabati* poetry in the UAE. He wrote in the romantic *baiti* style and also the modern *tafila* style, influenced by poets of Iraq such as Al Sayyab whom he met during his university days in Baghdad. In one of his *tafila* poems entitled 'A Dubaian Morning' he says:

Do not imagine that I am unmindful of love's meaning.
Deep inside me, the notes of longing stir my emotions
And the endless artistic nights
Throbbing with the strains of lute and guitar
And poetry fills my dreamy thoughts
Radiating from the heart.
Do not think that my love for you is a youth's infatuation
Springing from desire, with fire bursting in his chest.
Shaken by deprivation, he calls: 'I am in love!'

Hamad Bu Shihab (b.1936) on the other hand is a very staunch believer in the classical *baiti* form. He is one of the best known poets of the UAE and tends to polish his work. He is a good *nabati* poet and has compiled an anthology of UAE *nabati* poetry which includes most of the important UAE *nabati* poets. However, he has published only a limited amount of his own poetry in book form. One of his Classical Arabic poems is about the great benefits of the federation of the emirates:

Yesterday these Emirates were torn apart
In them destructive men created havoc.
And today we are enjoying security and stability
Forcing envious people to admire us.
Yesterday these were disunited emirates
Suffering ignorance, poverty, illness and chronic disease,
And today the Lord has bestowed upon us his grace
In uncountable abundance.
Yesterday, few people knew of our name
And today our voice reaches all corners of the Earth.
Oh! What a difference between our yesterday and today.

The author of this chapter, Dr Shihab Ghanem (b. 1940), writes both in the *baiti* and *tafila* styles. He has published eight volumes of Classical Arabic verse and a volume of English verse. He has also translated poems into English for a large number of twentieth century Arab poets and published them in several volumes including a volume consisting exclusively of UAE poems. In 1984 he won the UAE poetry competition and in 1997 won a Saudi Arabian prize for poetry from Abha. He writes about love, nationalistic topics and meditative poems. In one of his poems 'Will the Twain Ever Meet' he says:

The gap yet widens
Between the developing third world
And the advanced first world:
The third world moves backward
Towards a fourth place –
At least materially;
And the first world moves forward
Towards a zero!
At least spiritually.

Sultan Khalifa (b. 1942), a businessman from Dubai, has published several volumes of classical Arabic and *nabati* poetry. He writes in both the *baiti* and *tafila* styles. Dr Mana Saeed Al Otaiba (b. 1946) who obtained his doctorate in economics from Cairo has published around 30 volumes of classical Arabic and *nabati* poetry. He was, at one time, the Minister of Petroleum and Mineral Resources and wrote several well-publicized and amusing poems about the difficulties faced by OPEC ministers in reaching agreement on quotas and prices of OPEC oil. Some of those poems were translated into English. Love and sentimentalism are, however, his main themes although he occasionally writes nationalistic poems. Other themes include his children and mother. His poetry is in the classical *baiti* style. In a poem about his daughter Arwa, he says:

O rose in our house! How sweet!
Suffusing me with her perfume.
'Arwa', opening up in my life like a fragrant flower
Crowned by the morning dew.
Each time I see her my worries disappear,
And my heart simply smiles.

Habib Al Sayegh (b. 1950), a journalist from Abu Dhabi, writes Classical Arabic poetry. He started in the traditional *baiti* style but has left it almost entirely and tends to experiment in most of his poems, trying styles which are modern both in form and content. In a sensitive poem about an Indian youth who was run down by a car whilst working as a newspaper boy he says:

Every morning he says to them in a gentle voice 'Good morning'
Then calls loudly
'Ittihad – Ittihad
'Khaleej
'Ittihad' . . .
He calls
And calls . . .

One morning – fatefully
He was killed by a taxi
– May you all live long –
In the same street
At the unlucky top end of the street
Behind the bank, brimming with the accounts of the gentry.

There are approximately 50 other UAE poets writing in Classical Arabic whose names frequently appear in literary pages. Some write in traditional *baiti* style, others in *tafila* and some in both styles. Some try to experiment with modern poetry and even with prose poetry. Amongst the better known names are Mohammad Sharif Al Shaibani, Mohammad bin Hader, Salem Al Zamr, Saif Al Murri, Karim Matooq, Arif Al Sheikh, Arif Al Khajah, Ahmed Mohammed Obaid, Ibrahim Mohammed Ibrahim, Khalid Badr and Jaffer Al Jamri. Several of the younger poets who have been influenced by post-modernists have, over the past two decades, attempted to write prose poetry. The form can be difficult to understand.

There are also a number of female poets, most of whom write in the modern *tafila* or prose styles. These include Salihah Dhaiban (pen-name Rua Salem) and her sister Amina Dhaiban (pen-name Sarah Hareb), Salihah Ghabesh, Dhabia Khamees, Sheikha Maisoon Al Qasimi, Nugoom Al Ghanem, Aisha Busumait, Kaltham Shaibani and Kaltham Abdulla.

Rua Salem, in a poem lamenting the death of her father, also laments her childhood:

I did not find Masood
Or the shop.
Nor did I find my uncle.
I only found a mixture
Of Indians and Pathans
Living in that place
Living in every corner
That gave me in childhood a sense of security.
How I long to rest my head on my dad's chest
Like I did when I was a child
Whilst my dad played with my hair
And short locks.
For I was a princess
On the bosom of my dad.
Oh! If only dad could come back
And I could again return a child.

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Frauke Heard-Bey studied History and Political Science in Heidelberg and Berlin, obtaining her Ph.D. from the '*Frie Universitat'* in Berlin in 1967. Her thesis on the political changes in the capital Berlin between 1912 and 1920 was published in Stuttgart. She married her British husband in 1967 and followed him to Abu Dhabi, where he pursued a career with an oil company. In 1969 the author joined the recently established Centre for Documentation and Research in Abu Dhabi, which is dedicated to the collection of archive material from all over the world pertaining to the Gulf and the adjacent regions. Frauke Heard-Bey has published in English, German, French and Arabic in leading journals and handbooks for historical, sociological and Middle Eastern studies, participated in conferences and seminars; and she has been a member of the IISS since 1973. A second edition of her book *From Trucial States to United Arab Emirates. A Society in Transition*, first published in 1982, was republished in 1996.

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An earlier collection of papers, entitled *Perspectives on the United Arab Emirates*, was published at the beginning of 1997, to coincide with the twenty-fifth anniversary of the state. Since then, much has happened, not only in terms of the development of the country, but also in terms of research. While some chapters from that book are included in the present volume, several new chapters have been written, on foreign policy, industrialization, oil and gas, the environment and poetry; and others have been extensively rewritten and updated to incorporate the results of new research as well as recent developments. This second collection of papers, with a new title, seeks to present, therefore, an overview of the country at the beginning of the twenty-first century.

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